The Infantry School

MAILING LIST

A Semi-annual Publication
Containing the Latest Thought
on Infantry

VOLUME X—JUNE 1935

Prepared by the
Academic Department of the Infantry School
under the supervision of the
Assistant Commandant

U.S. DISTRIBUTED BY THE BOOK SHOP
THE INFANTRY SCHOOL, FORT BENNING, GEORGIA

4342—Benning, Ga., 3-26-35—3500

OCT 27 42

FOREWORD

The present volume of The Infantry School Mailing List contains material contributed by the following Infantry officers:

Major Samuel W. Gibson
Major William W. Eagles
Captain George A. Miller
Captain Howard Clark, 2d
Captain Joseph Gutkowsky
Captain Norman McNeill
First Lieutenant Joseph I. Greene.

Captain George A. Miller, assisted by First Lieutenant Joseph I. Greene, edited this volume.

The Mailing List also acknowledges indebtedness to the Chemical Warfare School, Edgewood Arsenal, Maryland, for the subject matter from which Chapters VIII and IX were written.

The drawings, map reproductions, printing and binding are the work of the enlisted personnel of the Infantry School Reproduction Plant, supervised by First Lieutenant George C. Mergens.

C. W. WEEKS,
Colonel, Infantry,
The Assistant Commandant,
The Infantry School.

OCT 27 '42

1021186

TABLE OF CONTENTS

			Page
CHAPTER	I.	Advance guards when contact is imminent	1
	II.	An advance guard in 1914, (Operation of French 5th Colonial Brigade, August 22, 1914)	25
	III.	Military English: Exactness of meaning	63
	IV.	The defense during periods of low visibility	69
	V.	A British night defense (Historical exercise)	85
	VI.	Tank targets	93
	VII.	The defense of the Meuse River at Dinant, August 14-15, 1914	101
	VIII.	Chemicals in riot duty	117
	IX.	Riot duty problems	137
	X.	Small problems—Infantry (historical)	161
	XI.	Supply of motorized infantry	199
	XII.	Supply problem, motorized infantry	213
	XIII.	Operations of the 3d Platoon, Company A, 301st Tank Battalion, September 26-29, 1918	223

CHAPTER I

Advance Guards When Contact Is Imminent

INTRODUCTION

"The distribution in width of the advance guard increases with the proximity of the enemy."

—Par. 219, Field Service Regulations, 1923.

The period just before two opposing armies gain contact is, of all times, the period when security and information of the enemy are most valuable and vitally necessary.

We must be ready for the enemy when we meet him. We must beat him to the punch by advancing just prior to contact in formations that admit of prompt development and deployment. There is no advantage gained by confining our advance guard elements to roads, distributed considerably in depth but with little dispersion in width. In fact it is extremely hazardous to do so. The study of modern war and of our Field Service Regulations can lead to no other conclusion.

For this reason our advance guards now advance in a fan-shaped, or partly deployed formation, whenever contact is imminent. But when contact is not imminent, the convenience and comfort of marching troops govern rather than tactical requirements. In this latter situation, we still adhere, and correctly so, to the point-advance party-support formation, with the entire command moving forward, in column or columns, on roads.

Thus advance guards at any given time operate under one or the other of two distinctly different conditions. As inferred above, these conditions are:

When contact with the enemy is imminent.

When contact with the enemy is *not* imminent.

The meanings of "imminent" that here apply are: "threatening to occur immediately; near at hand; or impending" said especially of misfortune or peril; hence, "full of danger," "threatening", "menacing", "perilous". It follows then, that when contact is imminent, it is time to do something.

The question immediately arises, "*When* does contact become imminent?" It stands to reason that a commander cannot estimate an exact moment, point, or line on the route of advance where the situation changes. Yet he can, however, by making the most of his reconnaissance agencies and other sources of intelligence, determine the approximate area within which actual contact will occur. He can, in effect, look at the country to his front as it appears on his map, and say: "From what I know of the enemy's movements and our own rate of advance, the line of probable contact is Line *A* (Figure 1). But contact with the enemy—particularly with his highly mobile motorized or mechanized units—is quite possible as close as line *B*. Therefore, contact becomes imminent when my force reaches Line *B*; and from then on, unless I receive definite information to the contrary, I will be within the area of imminent contact and assume that the enemy is near at hand, an immediate threat and menace."

Just how far Line *B* is from Line *A* is a matter for the commander to decide in each situation. So many factors enter into its calculation that it is impracticable to lay down a specific distance. It may be 1000 yards, and again it may be several days march. Time, space, terrain, composition of opposing forces—all must be considered in determining the area of imminent contact.

"*Who* decides when contact is imminent?" is naturally the next question. The commander of the whole force is in the best position to make this decision. It is he who issues the orders for the movement of the whole force with which the advance guards must work, who decides

whether the whole force is to act offensively or defensively. Also, he has before him all available information of the enemy garnered by the many intelligence agencies.

For these reasons, it is the commander of the whole force who, having determined the lines of probable and

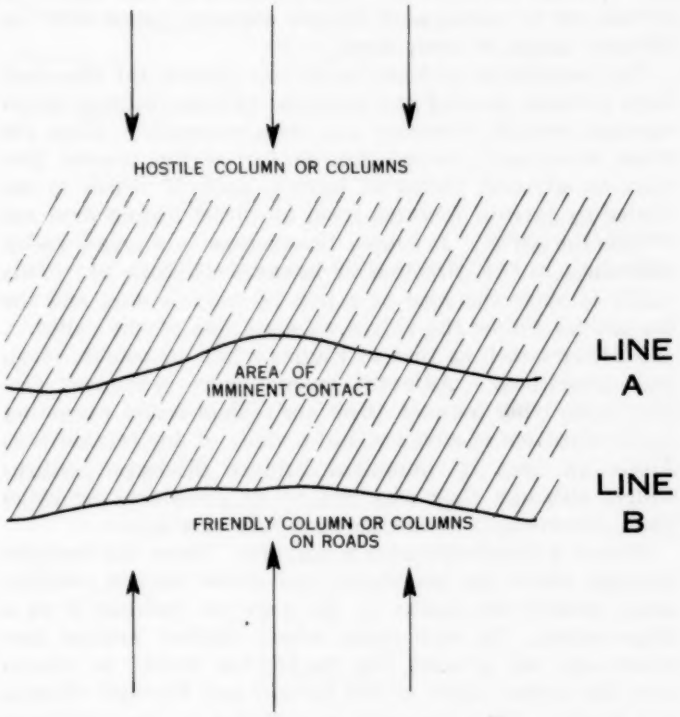


FIGURE 1

possible contact, and therefore the area of imminent contact, orders his forces to be redisposed, so that they *enter* this area prepared for impending combat. However, in unexpected contact, which in an alert command is very

exceptional, an advance-guard commander acts on his own initiative as in the past.

ZONES OF ADVANCE

This redisposition of forces consists, in general terms, of a partial deployment. The columns of the command spread out to advance in several adjacent zones with an advance guard in each zone.

The boundaries of these zones are drawn, for the most part, through natural and artificial terrain features which separate terrain corridors and compartments.* Thus the zones of advance correspond, as far as the ground permits, to adjacent strips of terrain, each of which is defiladed by terrain features from all direct hostile fires not within the strip. A simple illustration is a small valley extending in the direction of advance (Figure 2). This valley is made the zone of a unit of suitable size, and the boundaries follow the ridges on each side of the valley.

Corridors such as that in Figure 2 are, of course, ideal, and exceptional. Adjacent valleys with prominent terrain walls lying between them are seldom found extending in the direction of advance. But a study of any terrain that forms an area of imminent contact discloses features which, although they may not be as prominent as ridge lines, nevertheless divide the area into corridors.

Figure 3 illustrates such a corridor. Here the features through which the boundaries are drawn do not continuously protect the flanks of the zone yet defilade it to a large extent. In such cases, where distinct natural corridors are not present, the boundaries should be drawn over the higher parts of the terrain and through villages and woods. Thus the zone is defiladed to the maximum from fire delivered from an adjacent zone.

If the boundary is drawn as shown by the broken line *B*, troops in zone II may be stopped by fire from hill *A*,

*For a discussion of terrain corridors and compartments, see Chapter I, Terrain Compartments, Volume IX, Mailing List.

and may be unable to advance until troops in zone I drive out the resistance on hill *A*. If the troops in zone I are unable to do this, then much time is lost in coordinating the actions of the two advance guards against hill

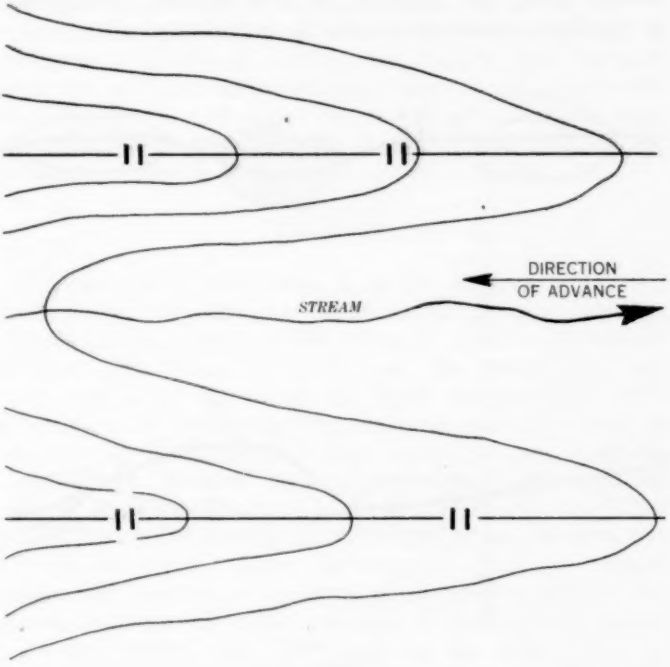


FIGURE 2

A. But by drawing the boundary as shown by the solid line, this coordination is obtained initially, and each advance guard is authorized to place fire upon or otherwise drive the enemy off of that part of hill *A* lying within its zone.

Resistance along the boundary can often be neutralized

by fire, and then forced to withdraw by passing the bulk of the advance guard by it and threatening complete envelopment. With the boundaries drawn as shown by solid line, Figure 3, such action may be promptly executed, for each advance guard is free to fire on that part of the terrain along the flanks of its zone without the necessity of further coordination with its neighbor.

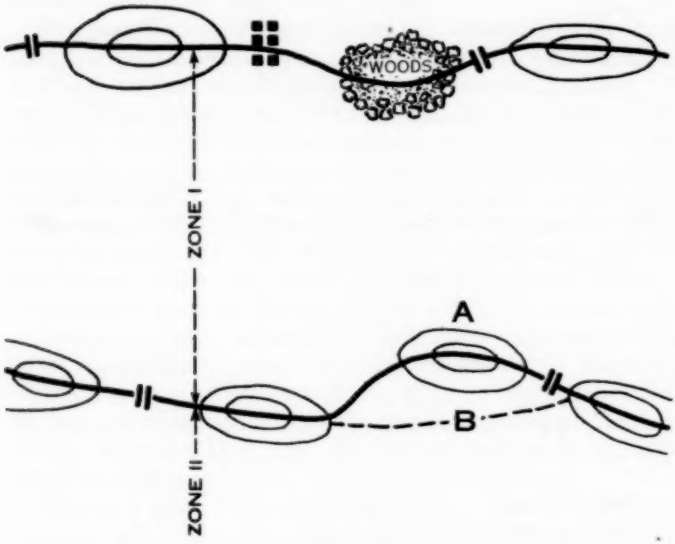


FIGURE 3

On the other hand, if hill *A* is an important tactical locality which cannot be passed by, but must be captured by actually occupying it, or secured for observation or other purposes, it is best to run the boundaries so that hill *A* lies wholly within the zone of a single unit big enough to deal with it. Its capture then becomes a task for that unit only. (This is especially important along phase lines, which are discussed later.) It is exceptional, however, in assigning initial zones of advance across the area of im-

minent contact, to run boundaries around high ground, villages, and woods, instead of through them.

Such a change of boundaries rarely happens, in fact, until the advance guards meet such strong hostile resistance that the commander of the whole force must issue new orders to cover the future action.

Furthermore, boundaries between adjacent elements in the area of imminent contact are not straight azimuth lines, nor are they continuously parallel, because the width of each zone is influenced by the terrain features over which its boundaries pass. In order to take advantage of terrain, a zone may vary considerably in width.

ORDERS

As we have already seen, it is the commander of the whole force who estimates when contact will become imminent, basing this prediction upon all enemy information at hand. He must then forewarn the elements of his force, and issue the order for their redisposition. The order must reach the smallest units in time for them to comply with it fully before they enter the area of imminent contact. If, after the commander has determined the area of imminent contact, some time is likely to elapse before the actual issuing of the order, he should send out a warning order. Later information may, of course, change his forecast of the area of imminent contact, and correspondingly, the place and hour of partial deployment.

On the other hand, there may be too little time, instead of too much. The commander, it is possible, may find that a move by the enemy threatens him unexpectedly. In this day of movement by motors, conditions change rapidly, although in an alert command, active reconnaissance should never permit the force to be caught unawares.

Nevertheless, contact may become imminent at any time, and find the force variously disposed. The force may be in bivouac, for example; and because of a hostile move-

ment, contact with the enemy may be imminent as soon as the force starts its advance from bivouac.

Assume that the 1st Division halts for the night in the bivouac, *A*, (Figure 4), with outpost as shown; and that contact with the enemy is not considered imminent even for the next day's march. Then further suppose cavalry patrols report that a hostile force, estimated to be an infantry brigade with artillery, detrucked at points *B* and *C* at midnight and started moving toward *A* in two columns, so that the 1st Division might expect to meet the hostile force anywhere between its outpost and the line *BC*. In this situation the advance guards should be ordered to take up the partly deployed formation as they advance from the bivouac—certainly no later than passage of the outpost lines.

On the other hand contact with the enemy may become imminent during the progress of a march. For example, let us again assume that the 1st Division began a march from bivouac *A* expecting to reach the line *BC* without meeting the enemy. (Figure 5.) During the march, while the division is in the formation shown, or any similar formation, we shall further assume the receipt of information that a hostile reinforced brigade, in two columns, is approaching the 1st Division with the heads of hostile columns on the line *BC*. If the distance to line *BC* is, say, only four or five miles, then the commander of the 1st Division should reason that contact has become imminent and therefore immediately issue an order for the change from route formation to a partly-deployed formation.

FORMATIONS

The order of each commander prescribes the zones of advance to be covered by the next lower units, upon entering the area of imminent contact. The advance guard of each zone is partly deployed and continues thereafter to move forward on a wide front until contact is gained or the situation otherwise changes from one of imminent contact.

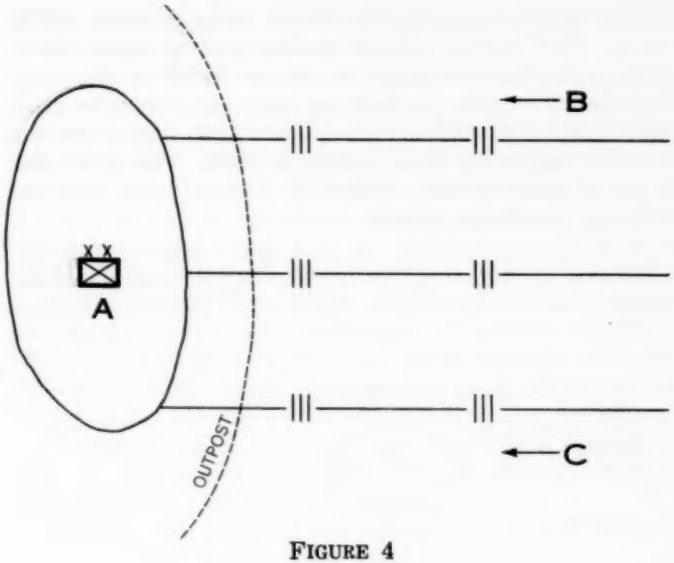


FIGURE 4

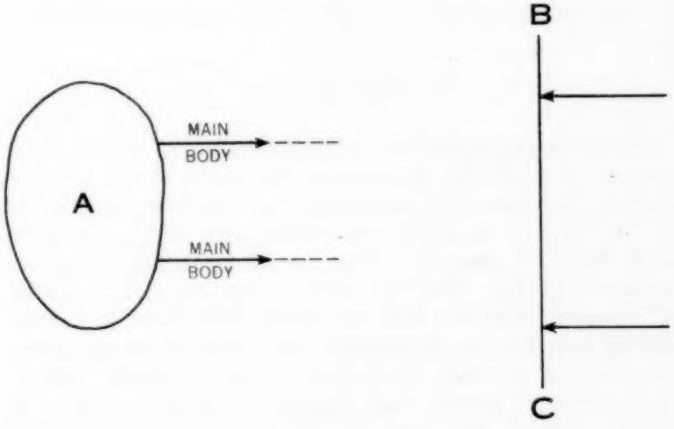


FIGURE 5

Each advance guard advances in three echelons. (Figure 6.) The leading echelon is composed of small reconnaissance groups covering the entire width of the zone. The second echelon is made up of combat groups from which the reconnaissance groups are sent, and which act in close support of the forward echelon. The remainder of the advance guard, formed in one or more reserves, composes the third echelon.

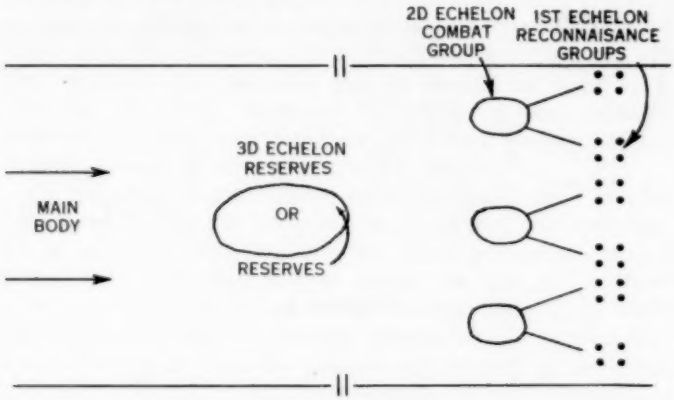


FIGURE 6.

The exact formation varies considerably, of course, and depends on a number of factors: the width of the zone of advance, the size and composition of the advance guard, the location of expected resistance, and the anticipated employment of reserves. The forward echelon of reconnaissance groups, however, must cover the entire width of the zone. But this does not mean that there is a continuous thin line of skirmishers stretched across the zone. This echelon is made up, rather, of an irregular line of reconnaissance groups sent forward from the echelon of combat groups. They may be half squads, or squads, acting in the manner of reconnaissance patrols. At any stage of the advance, their number varies according to the width

of the zone, and the nature of the terrain as it effects visibility and good patrolling.

But the width of the zone varies according to the nature of the terrain. A regimental zone with a battalion in advance guard, may be at one place only 1000 yards wide, and at another, 2000, according to the varying width of the corridor. In open country in the narrower parts of the zone, it may be possible for one company to cover the entire regimental front, and yet permit its commander to retain adequate control of the company. But in the wider parts, the company commander might not be able to direct his company to the best advantage. Therefore the disposition of the units of the advance guard depends primarily on control, and control depends to a large extent on the nature of the terrain.

A battalion acting as an advance guard in a regimental zone, or a narrow brigade zone, may be disposed in various formations, three of which are:

(1) One rifle company composing the first two echelons

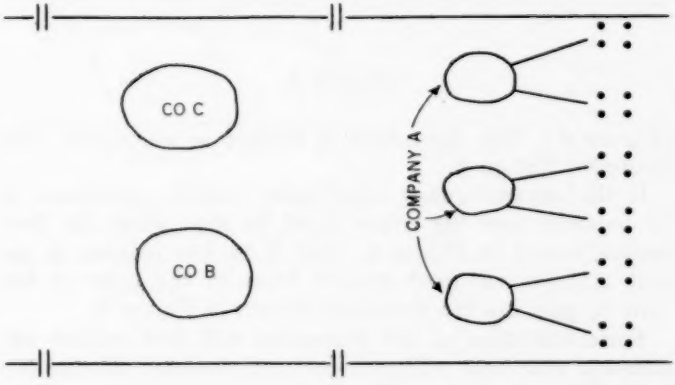


FIGURE 7.

(reconnaissance and combat groups), and the other two rifle companies in one or more reserves. (Figure 7.) This

formation is rarely used and is possible only in a narrow zone of advance in open country where visibility is excellent. Otherwise control of the two leading echelons is too difficult.

(2) Two rifle companies composing the two forward echelons and one rifle company in reserve. In this case the entire zone is subdivided into two company zones.

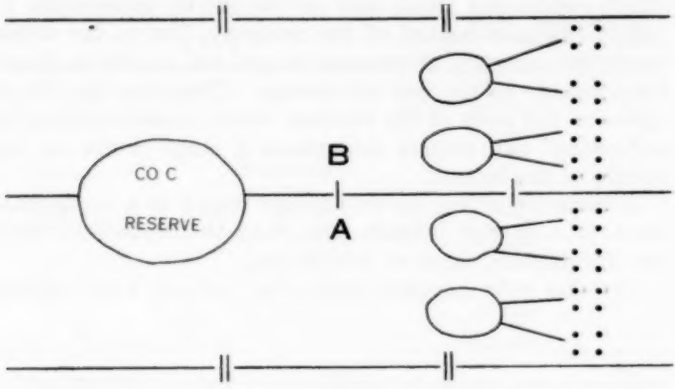


FIGURE 8.

(Figure 8.) This formation is subject to variations. For example: Figure 9.

If the advance-guard commander expects resistance to be uniform over his entire front he may adopt the formation shown in Figure 8. But if he has reasons to expect that he will need greater force in the right of his zone he may use the formation shown in Figure 9.

Some variation of this formation will find greater application than that with one company leading (Figure 7), or the formation given below (Figure 10).

(3) All three companies in line, each making up a part of all three echelons. (Figure 10.) This formation has two distinct advantages: (1) easy lateral control, (2) strong driving power past isolated hostile resistance—the best

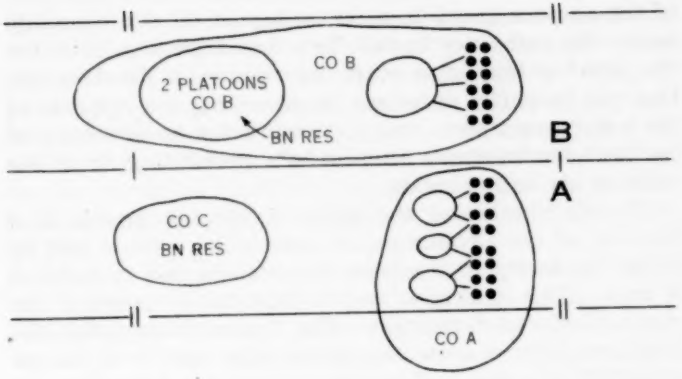


FIGURE 9.

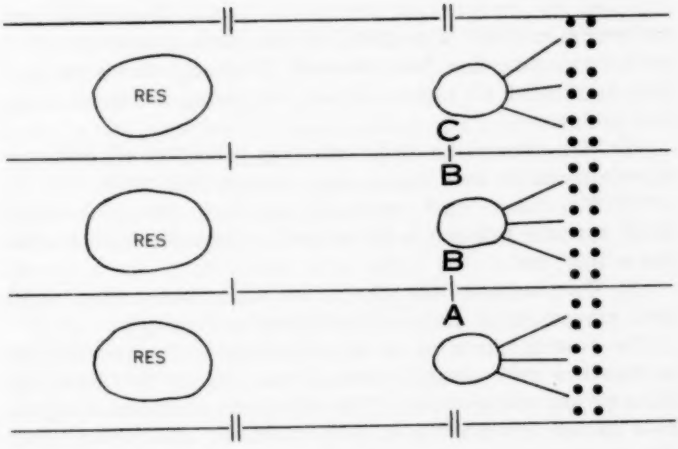


FIGURE 10.

method of reducing isolated hostile resistance is for part of the advance guard to move on beyond it, which usually causes the resistance to fall. This formation has, however, the disadvantage of a scattered reserve, a disadvantage that can be partly overcome by advancing the reserves of the outer companies close to the interior boundaries and by the advance-guard commander's prohibiting their use without his authorization.

The distribution of the units of advance guards is a function of the advance-guard commander. He is told by higher authority that contact is imminent and is assigned a zone. This indicates to him that he is to adopt the partly deployed formation. The higher commander depends on him to cover the entire zone, and it is his responsibility to dispose his advance guard to gain this end.

COORDINATION AND CONTROL

Coordination of the advance of adjacent advance guards, and between each advance guard and its main body, is obtained by designating successive phase lines and prescribing a method of controlling the further advance after each phase line has been secured. There is no set method that applies in all cases. There are many methods, some of which are:

(1) To prescribe a time schedule, directing all advance guards to clear each phase line at a certain time.

(2) To direct each advance guard to move forward from a phase line when those next adjacent arrive on the phase line; or

(3) To prohibit advance from each phase line until such movement is ordered by higher authority.

The system based on a time schedule is impractical for an advance over several phase lines. Owing to the variations of the terrain and differences in resistance encountered in the several zones, some advance guards are usually unable to comply with the schedule. Of the three methods listed above, a combination of (2) and (3) is generally the best. However, any sound method of co-

ordination and control must comply with the principle that each echelon in rear of the first remains continuously within supporting distance of the next preceding one. And this means that it is also in communication. Thus, a main body commander should not allow his advance guard to get so far ahead of an adjacent advance guard that its safety is jeopardized. To prevent a flank from thus being uncovered an advance guard does not ordinarily move beyond a phase line until adjacent advance guards have arrived thereon.

The fact that control and coordination are always difficult requires especial effort on the part of all leaders to maintain it. Constant patrolling between adjacent advance guards and adjacent main bodies is necessary, and visits of staff officers to units on the right and left must be frequent. Not only transmission of information from front to rear, but the transmission of information and instructions from rear to front, should be prompt and vigorously followed up. Commanders, indeed, must make the most of all means at their disposal in order to insure control and coordination.

Furthermore, control and coordination are enhanced by a proper and intelligent selection of phase lines. Where practicable, phase lines are prescribed so that the main body is not required to pass beyond one phase line before the advance guard secures the next succeeding one. This, of course, is not always practicable. The terrain may prevent it, and the principle must be observed that the distance between the advance guard and the main body should never be so great as to allow the defeat of the advance guard before the main body can support it.

It is evident, therefore, that no fixed distances are prescribed between elements of the advance guard or between the main body and the advance guard. These distances vary according to the distances between phase lines and in accordance with the principle governing the conduct of the advance—that each succeeding echelon should at all times be in supporting distance of the preceding one.

THE TERRAIN COMPARTMENT

The movement of the advance guard is controlled laterally by the boundary lines of the zone and its forward movement is regulated by phase lines traversing the zone more or less perpendicular to the boundary lines. Subject to certain variations discussed above, the lateral boundary lines of an advance guard zone should pass over the higher parts of the terrain and through woods and villages. Thus the zone is defiladed as far as the terrain permits from fire delivered from adjacent zones.

Phase lines likewise should pass along the high terrain and through woods and villages so that the area in rear of each phase line is defiladed from direct fire and (as soon as the line is occupied) from observed indirect fire delivered from positions forward of the phase line. The reason for this, of course, is that such a line is usually the best position both for organizing a defense and delivering an attack.

Thus, the zone boundary lines and any two successive phase lines (*AA'* and *BB'*, Figure 11), form a terrain compartment inclosed by high ground, woods, villages, or other terrain features that defilade the compartment in all directions. Common sense tells us that we will seldom find this ideal. But a careful study of the terrain must be made and these lines so designated that the ideal is approached to the fullest extent possible.

DEVELOPMENT OF ADVANCE-GUARD ACTION

Now the important question: How does an advance guard act when it encounters enemy forces of various sizes? Before answering this let us call to mind the general mission of the advance guards. This mission is twofold. For as long as possible the advance guards insure the uninterrupted advance of the main body. And then, upon contact with a hostile force of such strength that the uninterrupted advance of the main body is no longer possible, an advance guard insures enough time and space

for its main body to maneuver in accordance with the will of its commander.

In accomplishing this dual mission, an advance guard performs the following specific duties:

It removes obstacles, repairs roads, and facilitates in every other practicable way the uninterrupted advance of

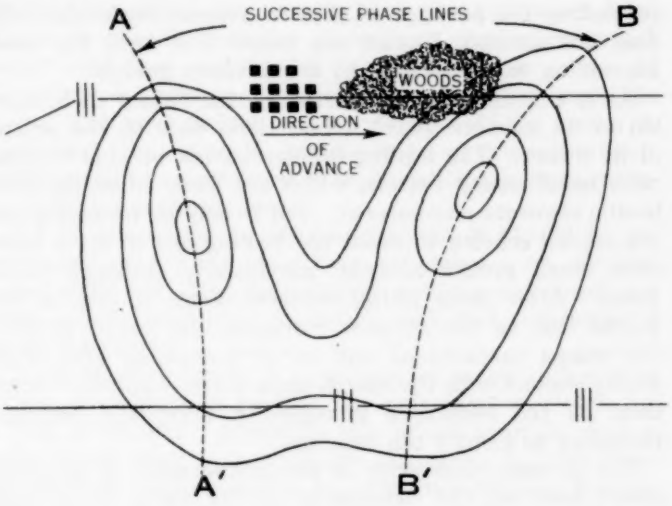


FIGURE 11.

the main body.

It reconnoiters to the front and flanks in order to guard against surprise, and to obtain information of the enemy.

It drives back small parties of the enemy in order to prevent their observing, firing upon, or delaying the main body.

It secures for the main body such terrain features as hills and ridges that defilade the main body from possible hostile fire and observation, and that provide good defilade and observation for friendly artillery.

Upon encountering the enemy in force, it determines his

dispositions, particularly the flanks, and checks the hostile advance long enough to give the commander of the main body time to employ his whole force as he desires.

In performing these duties an advance guard must continuously guard against surprise. This it does by adopting the partly deployed formation, and exploring all places likely to contain the enemy in any force, and also by regulating the advance so that in general the main body does not advance beyond one phase line until the next succeeding one is secured by the advance guards.

As it encounters small parties of the enemy each echelon of an advance guard drives them back to the extent of its power. The leading echelon should be able to cope with small enemy patrols, which are likely to be the first hostile elements encountered. But it may be necessary for the second echelon to assist the leading one to drive back some small groups offering particularly stubborn resistance. After these initial contacts occur, it can be expected that as the advance continues, the bodies of hostile troops encountered will be of increasing size, until finally contact with the hostile main force is gained. And, then, as the resistance increases it eventually becomes necessary to employ the reserves.

But at some time prior to the commitment of advance-guard reserves, the commander of the whole force must tell the advance-guard commanders what he intends to do with the whole force, and what he wants the advance guards to do. This step should be taken as soon as the commander arrives at his decision. It may be taken even at the beginning of the advance, or at any time during the advance, and in any case must be taken before it becomes necessary for advance-guard reserves to be used. The earlier the better, of course, so that advance guards can act without delay and with intelligent cooperation in furthering the contemplated action of the command as a whole.

The commander of the whole force may decide to defend, or to attack. If the decision is to defend, he orders the advance guards to secure a certain line. Each ad-

vance guard then acts according to the situation. If the enemy advance element is holding this line, the advance guards attack and drive them back. If there are no hostile troops on the line, the advance guards merely continue forward far enough to hold the enemy beyond small-arms fire so that the main body can occupy the line.

If the decision as regards the whole force is to attack, the advance guards are usually given the mission of driving in the hostile covering forces and continuing to advance until they are stopped by the enemy in force. If the enemy is found in a defensive position, they locate his strong and weak points, and his flanks. If the enemy is advancing, the advance guards seek to delay him sufficiently for the main body to make deliberate preparation to carry out its intention.

All of this action by advance guards, it should be remembered, is for the main body or bodies. An advance guard does not fight independent actions, but must, instead, closely coordinate its action with that contemplated by its main body.

If an advance guard is given a mission requiring it to attack, it employs in general, the principles of attack for a unit of its size. Naturally this attack must be over a wider front than is normal for the unit. It, therefore, attacks with shallow depth, and does not hesitate to commit all reserves, even initially, when necessary to accomplish its mission.

The flanks of the zone are usually protected from hostile observation and fire except from within the compartment they enclose. Extending across the zone lies the next phase line, usually on high ground. This phase line is the objective of the advance-guard attack. It is along the protected flanks that the attack has its best chances of advance to its objective. Therefore, unless the center of the zone offers an excellent avenue of approach, the attack should be stepped forward on the flanks of the zone.

Small parties of the enemy are likely to be found along the flanks of the zone. To advance up the center of a

zone, then, is to invite flanking fire from such groups. Therefore the action of an advance guard should be directed principally along the flanks of a zone. One good method, for example, that may be used is to take out initially small hostile groups at *A* and *B* simultaneously. (See Figure 12.) Then, according to the resistance un-

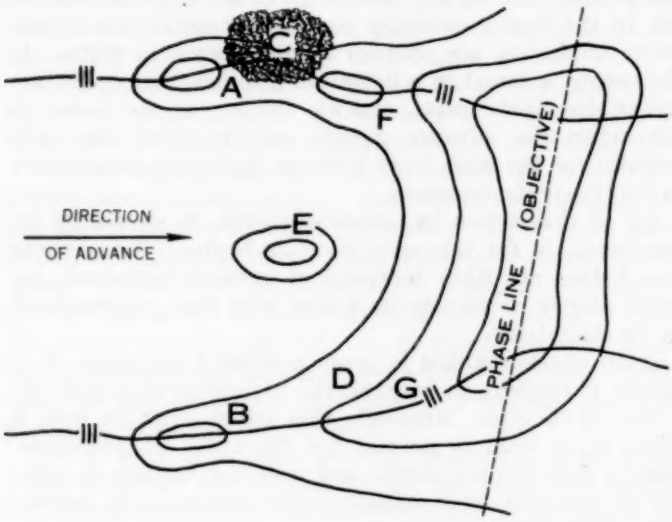


FIGURE 12.

covered, to concentrate all fires of the advance guard on *C* until that position is taken; then on *D* until that position is captured, and continuing in like manner until *F* and *G* are taken, and then to place all fires on *E* until that resistance is captured or neutralized. By this time the entire advance guard of this zone is in front of its objective prepared for an attack thereon.

This alternate "shouldering forward", with all fires, including advance-guard artillery, concentrated successively as just described, produces a more successful, less costly,

and in the end, more rapid advance than does action contemplating a simultaneous advance over the entire zone. But it is not the only method. For example, stubborn resistance may be uncovered at *D* and weak resistance on the left flank. In that event, it is probably better to push the attack successively on *C*, *F*, and *E*, thus bringing about the downfall of *D* and *G*.

COORDINATED ATTACK AND TACTICAL INTEGRITY

At some stage of the advance the commander of the entire force may anticipate the necessity for a close coordination of the attack of the several advance guards. When this is the case, he assumes direct control over all the advance guards, or places them under a single commander responsible to him. When this occurs, they pass, of course, from the control of the column or zone commanders. The commander of the whole force forms plans and issues orders to the now consolidated advance guards. Nevertheless, in this case the actions of the units that comprised the several formerly separate advance guards are essentially the same as explained heretofore.

After such a consolidation, a battalion in the advance guard will find itself acting under a new commander and may even find that it is no longer preceding its own regiment. For example, Figure 13 shows that since the 1st Battalion 1st Infantry and 1st Battalion 2d Infantry are engaged with the enemy, the tactical unity of these two regiments is broken up and will probably remain so until the attack is over.

SMALL FORCE OPERATING ALONE

This discussion is based primarily on the advance of a large force across the area of imminent contact. Such a force is generally opposed by a hostile force of roughly corresponding size, or at least by another large force. Dur-

ing this stage of the advance the hostile force is sufficiently "fixed" for our advancing force to "fix" itself as to direction. In other words, by the time a large force partly deploys upon entering the area of imminent contact, a large hostile force is then too close to change direction without dangerously exposing its flank. But what about a small force, such as a regiment or battalion acting alone?

In the first place a regiment or battalion seldom operates on an entirely independent mission. Such units, however, are often called upon to move alone, wholly or partly uncovered, as semi-independent elements such as a flank guard, or the enveloping force in an attack. In such cases, they may not have within themselves sufficient advance intelligence agencies to determine that contact is imminent. But they are usually operating in conjunction with a larger command whose commander should supply the smaller unit with all possible information pertinent to the determination of imminent contact. Through these means and its own reconnoitering, a small force endeavors, and is often able, to determine when contact is imminent. Having once determined that, its advance guard, for the same reasons that govern those of a large command, should thereafter move forward in a partly deployed formation ready for battle.

Small independent advance guards modify, of course, the formations suggested above for large units. Advance along a terrain corridor may not be feasible. Instead, they can, for example, move partly deployed, astride the route of advance covering some distance to its flanks. Having no adjacent advance guards, it must patrol to its flanks.

The size of the unit is immaterial. Any unit is responsible for its own security. And when there is reason to believe that contact with the enemy is imminent, it is inexcusable for a unit of any size to continue its advance without taking the precaution of preparing itself for combat by partly deploying at least its advance guard.

ADVANCE IN CLOSE OR BROKEN TERRAIN

Even when contact with the enemy is imminent, there will be cases, in rare instances, when the advance guard cannot be moved forward in the manner herein described.

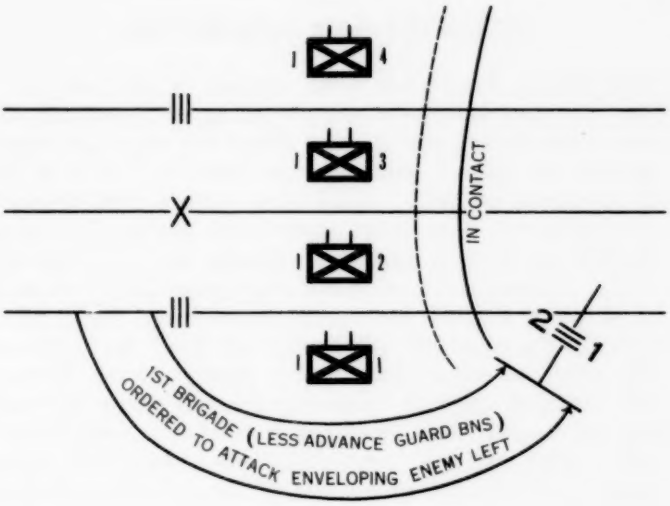


FIGURE 13.

In very close or broken terrain, with limited routes, the advance guard may temporarily be forced to revert to column formation with considerable distances between units. This would require patrolling to cover the zone and maintain contact with adjacent advance guards.

CHAPTER II

An Advance Guard in 1914

(HISTORICAL MAP PROBLEM)

On the 20th of August, 1914, the French armies from the Sambre River to the Vosges Mountains were not only ready but eager for battle. And to the French high command it appears that the opportune moment to unleash these valiant armies is at hand. For the Germans, in order to augment their large forces now swinging west through Belgium, directly across the front of the French Fourth Army, must have weakened their center.

To make the decisive thrust, the Fourth Army is to march north from the line of the Meuse, crush the supposedly weak German center, and strike in flank and rear the whole German movement through Belgium. The Third Army, echeloned to the right rear, is to protect the right flank, while the Fifth Army and the British Expeditionary Force on the left are to conform to the general advance.

With but one thought—battle to avenge Sedan—the Fourth Army sprang forward. Advancing in a staircase formation, its six corps were echeloned to the right rear in order to provide flank protection on the right.

By the evening of August 21st, the locations of the corps of the Fourth Army were as shown in Figure 14. During the advance that day German cavalry patrols had been encountered. Nevertheless, all ranks, discounting this indication, believed that no German forces of importance would be met on the 22d. This firm belief was based on reports of French aviators that there was no important assembly of German troops in the vicinity.

Mailing List——2.

Therefore August 22d is to be a march day, not a battle day; a day of quickly brushing aside hostile advance elements while each column drives rapidly forward to pierce the side of German main forces.

But the days and nights immediately preceding the 22d have been hard on infantry units. During the night of August 20-21 the 5th Colonial Brigade, a separate brigade of the Colonial Corps, had marched 19 miles, and by 7:00 AM on the 21st, was in the area Gerouville—Margny. This brigade consisted of the 21st and 23d Colonial Infantry Regiments; and, in addition, some artillery and engineers, and a platoon of Reserve Dragoons (heavy cavalry).

These were elite troops, of high morale, led by officers with much war experience in the colonies. Most of the personnel were familiar with the crack of bullets, and the troops called themselves the "masouins" (the ugly, dirty ones). Only the cavalry, old reservists on requisitioned and unsuitable horses, was not up to its job.

During the afternoon of August 21st, Colonel Neple, commanding the 23d Colonial Infantry at Gerouville, received an order attaching the cavalry platoon (25 dragoons) and a battery of artillery to his regiment, and directing him to push north to Jamoigne. Upon arrival there he was to gain contact with a detachment of the 3d Colonial Division, Colonial Corps, at St. Vincent, and with detachments of the XII Corps at Izel.

This movement began at 2:00 PM in a torrential rain. And owing to a tie-up in the distribution of rations, the regiment had to leave Gerouville without a hot meal. German cavalry patrols were encountered throughout the march, and when the regiment reached Jamoigne at midnight, the men were soaking wet, tired, and hungry.

By daylight (4:00 AM) the 22d of August, no orders for the day had reached the 23d Infantry. Nevertheless Colonel Neple decided to move to Les Bulles (See Figure 15, map in pocket at end of the book), leaving two

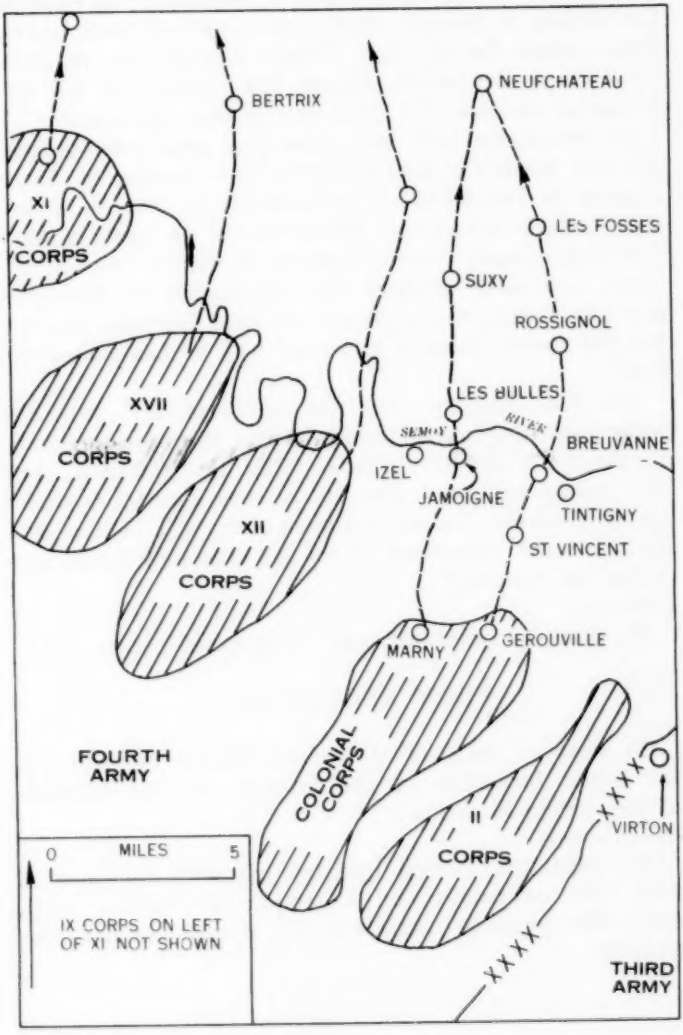

BERTRIX
NEUFCHATEAU
XI
CORPS
LES FOSSES
SUXY
ROSSIGNOL
XVII
CORPS
LES BULLES
SEMOY
RIVER
BREUVANNE
IZEL
JAMOIGNE
TINTIGNY
XII
CORPS
ST VINCENT
MARNY
GEROUVILLE
FOURTH
ARMY
COLONIAL
CORPS
II
CORPS
XXXX
VIRTON
XXXX
THIRD
ARMY
0
MILES
5
IX CORPS ON LEFT
OF XI NOT SHOWN

FIGURE 14

companies at Jamoigne to protect the town and the brigade against hostile cavalry. As the regiment was entering Les Bulles, a brigade staff officer arrived with operations orders for the day. These directed the regiment to continue the march, though the troops had not had breakfast and had but little rest during the night.

In compliance with the operations orders for August 22d the whole Colonial Corps is now moving on Neufchateau in two columns, as indicated in Figure 14 and will "attack the enemy wherever he is encountered". The right (east) column consists of the 3d Colonial Division and corps artillery and will march via Rossignol and Les Fosses, while the 5th Colonial Brigade, forming the left (west) column, moves by way of Les Bulles and Suxy.

The 23d Infantry (less the 3d Battalion), with the platoon of dragoons attached, forms the advance guard of the 5th Colonial Brigade. The 1st Battalion (less two companies) and the 25 reserve dragoons, under Major Geoffroy, battalion commander, will be the support, and the remainder of the advance guard will constitute its reserve.*
platoons.

No time for breakfast, only hard bread! Move out!

FIRST REQUIREMENT

So much of the plan of Major Geoffroy as relates to the initial formation of the support and the missions of its various elements.

---

*In 1914, the French infantry battalion consisted of four rifle companies and a section of machine guns. Each rifle company was about 250 strong and had four platoons.

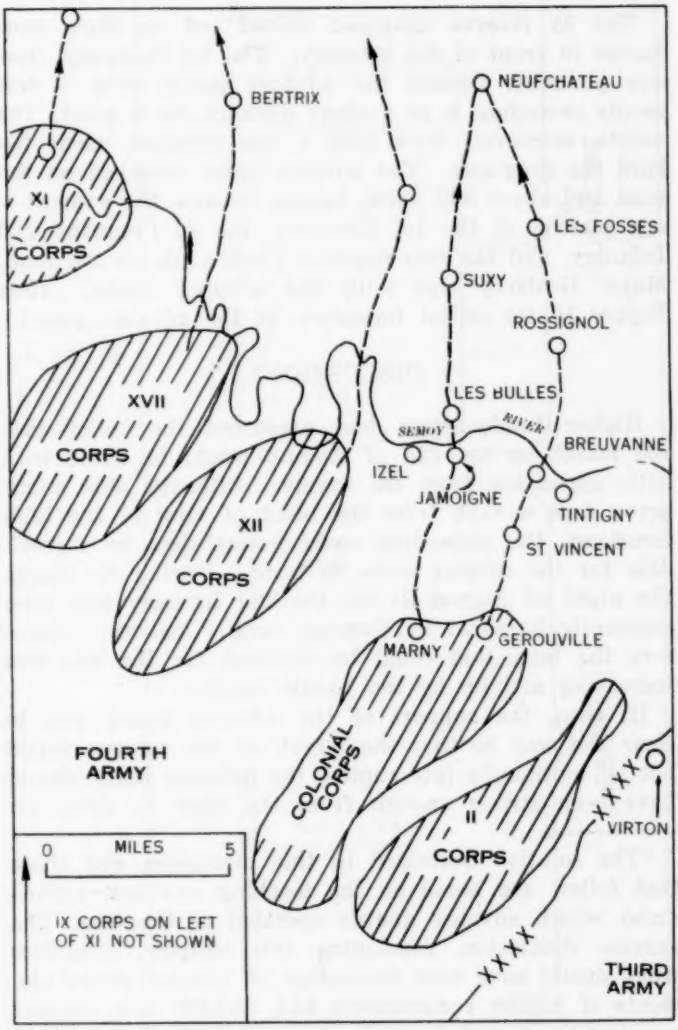

BERTRIX
NEUFCHATEAU
XI
CORPS
LES FOSSES
SUXY
ROSSIGNOL
XVII
CORPS
LES BULLES
SEMOY
RIVER
BREUVANNE
IZEL
JAMOIGNE
TINTIGNY
XII
CORPS
ST VINCENT
MARNY
GEROUVILLE
FOURTH
ARMY
COLONIAL
CORPS
II
CORPS
XXXX
VIRTON
0
MILES
5
IX CORPS ON LEFT
OF XI NOT SHOWN
XXXX
THIRD
ARMY

FIGURE 14

HISTORICAL SOLUTION

The 25 reserve dragoons moved out on their slow horses in front of the infantry. The 1st Company (less one platoon), formed the advance party, with a few scouts preceding it at a short distance, as a point. The scouts, moreover, were only a few hundred yards behind the dragoons. The advance party marched on the road and about 200 yards behind it came the support—one platoon of the 1st Company, the 2d Company 23d Infantry, and the two machine guns—, all on the road. Major Geoffroy was with the advance party. (See Figure 16 for initial formation of the advance guard.)

DISCUSSION*

Higher headquarters had expressed the belief that the march on the 22d of August would be made with little opposition from the enemy. Although this might prove true enough from the point of view of the high command, the opposition could nevertheless be formidable for the smaller units in front. During its march the night of August 21/22, the 23d Infantry had been constantly harassed by German cavalry patrols. Therefore the least that could be expected for the 22d was increasing activity by the hostile cavalry.

If, then, the support of the advance guard was to clear the way so that the march of the reserve would not be continually interrupted, the advance party should have been strong enough from the start to drive off

*The solution contained in this discussion and those that follow are based on the teaching and instructions under which advance guards operated at the time. The general discussion, concluding this chapter, considers what should have been the action of advance guard elements if higher commanders had decided that contact was imminent, and directed advance guards to move forward in contiguous zones.

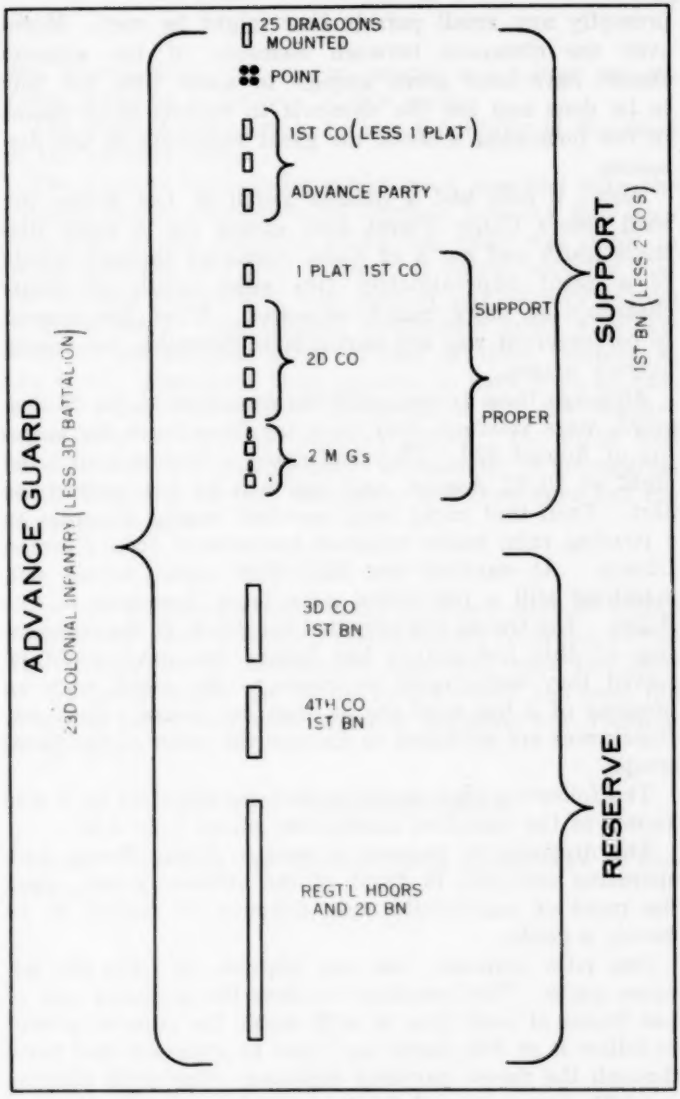


FIGURE 16.—Advance-guard formation (not to scale).

promptly any small patrols that might be met. Moreover the distances between elements of the support should have been great enough to allow time for this to be done and for the elements to resume their places in the formation without too great reduction of the distances.

About a mile and a quarter north of Les Bulles the road enters Chiny Forest and, except for a short distance south and north of Suxy, continues through woods to a point approximately two miles south of Neufchateau—the day's march objective. Thus the ground to be traversed was not particularly favorable for enemy cavalry action.

Although these troops, with the exception of the 25 dragoons, were veterans, they were far from fresh the morning of August 22d. They had made a 19-mile march the night of 20/21 August, and had had no hot supper the 21st. Then that night they marched nearly 10 miles in a pouring rain, under constant harassment from German Uhlans. At daylight the 22d, they again moved out, marching still a few miles more from Jamoigne to Les Bulles. The troops had expected breakfast at the termination of this last march but before the meal could be served they were again en route to the north with no prospect of a hot meal for at least five hours. Such circumstances are sufficient to dampen the ardor of the finest troops.

The following plan seems to meet the situation as it was known to the battalion commander about 6:00 AM:

The dragoons to proceed at once to Chiny Forest and, operating one mile in front of the advance guard, clear the route of march—the mile distance, of course, to be merely a guide.

One rifle company, less one platoon, to form the advance party. This company to clear the northern exit of Les Bulles at such time as will enable the support proper to follow it at 600 yards, and then to approach and move through the forest partially deployed. One rifle platoon, one rifle company, and the two machine guns, in that or-

der, to constitute the support proper and follow the advance party at a distance of 600 yards.

The support commander to march initially at the head of the support proper.

The support commander might have marched with the advance party. However, no German infantry had been seen and, in the situation as known, none was liable to be encountered in Chiny Forest. It seems probable that the advance party could take care of any cavalry patrols it might meet. The support commander could ride forward to the advance party in two or three minutes at any time. Therefore, there appears to have been no particular reason under the circumstances for the support commander to leave the support proper. He might well have directed the advance-party commander to act aggressively whenever he met resistance, and then have left the execution to him.

As the dragoons approach the southern edge of Chiny Forest, they receive heavy small-arms fire from the woods. The advance-party commander, marching near the head of his party, hears the firing to the front and sees the dragoons falter and show signs of breaking and running to the rear.

SECOND REQUIREMENT

Orders issued by the advance-party commander at this time.

A SOLUTION*

Here the advance party was on the road. Fortunately for the French, German cavalry at this time was not equipped with machine guns or machine rifles, or both the point and advance party might have suffered heavy casualties.

The advance party should deploy at once astride the road, and then advance to the woods as rapidly as the hostile fire permitted.

---

*Not the historical solution.

HISTORICAL SOLUTION

When fired on, the dragoons dashed back to shelter behind the advance party, which was then about 650 yards south of the woods. The advance-party commander deployed one platoon to the right and one platoon to the left of the road, while the third platoon formed in single file in a ditch alongside the road. The three platoons then moved forward.

In a few minutes about twenty Germans just inside the forest, are seen to leap on horses and gallop to the north. No other enemy can be seen.

THIRD REQUIREMENT

(1) Should the dragoons be ordered to the front again or not? Why?

(2) What change of formation, if any, should the advance-party commander now order?

A SOLUTION*

(1) Yes. The dragoons do not promise to be of much value in a real fight; but by locating the next position taken up by the Uhlans before the French infantry arrive and then informing the infantry commanders of this location, they can enable these commanders to act promptly and with a minimum of casualties.

(2) Since it can be expected that small hostile cavalry groups will continue their efforts to delay the French march through the woods, the point and the advance party, as soon as the near edge of the forest has been taken, should partially deploy and advance astride the road. Of course, if underbrush is so thick that movement is slowed down to less than the normal rate of march, this formation is not practicable. But if the ground is neither extremely rough nor covered with vegetation or heavy underbrush, individuals or small groups in squad column can march across country at two and a half miles per hour with little more fatigue than when marching on roads.

When troops are moving in the immediate presence of the enemy, as they were in this case, fewer casualties and more rapid action against resistance result if the forward elements of the advance guard take up a partially deployed formation, instead of marching in column of squads or column of twos along the road. However, the exact formation depends to a considerable degree on the terrain. With one of our rifle squads as point and one of our rifle platoons, less one squad, as advance party, a formation similar to that shown in Figure 17 is suitable when the enemy is as liable to appear on the flanks as to the front.

---

*Not the historical solution.

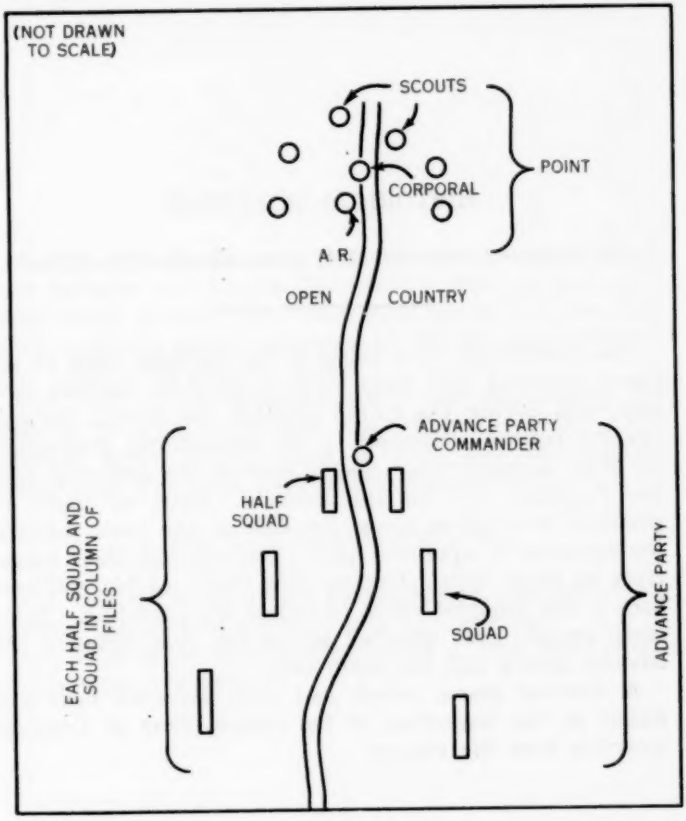

(NOT DRAWN TO SCALE)
SCOUTS
POINT
CORPORAL
A. R.
OPEN COUNTRY
ADVANCE PARTY COMMANDER
HALF SQUAD
EACH HALF SQUAD AND SQUAD IN COLUMN OF FILES
SQUAD
ADVANCE PARTY

FIGURE 17

HISTORICAL SOLUTION

The dragoons resumed their place ahead of the infantry.

The inhabitants of a house at the southern edge of the forest reported that Suxy was occupied by German cavalry, and during the march through the forest, German cavalry patrols continued to be encountered frequently. By their audacity they clearly showed the contempt that the Germans felt for the French. Some of them, in positions in a ditch along the side of the road, allowed the dragoons to approach quite close, emptied their magazines at them, then, jumping into their saddles, galloped back a few hundred yards to repeat the operation. Some small patrols even galloped across the road between the advance guard and the main body.

A German plane, which had been observed near Les Bulles at the beginning of the march, flew at frequent intervals over the column.

As the French dragoons arrived, about 8:30 AM, at road junction *A* (Figure 15), on the high ground 1100 yards south of Suxy, they were fired on by riflemen. But being unable to locate the source of the fire, they dropped back behind the advance party.

The point of the advance guard is now approaching the crest of the hill overlooking Suxy from the south. The advance party is 100 yards in rear, and the support proper only 225 yards back of the advance party.

FOURTH REQUIREMENT

(1) Orders issued by the advance-party commander regarding the advance north of this high ground.

(2) Plan of the support commander at this time for use of the support proper.

A SOLUTION*

(1) When riflemen undertake to advance without concealment or cover in the face of fire from modern weapons they must expect to suffer excessive casualties. Hence a commander should not order his riflemen to advance under such circumstances unless his mission makes it imperative to do so. Such exceptions will probably occur more often in advance-guard actions than in any others.

The situation under consideration, however, does not appear to warrant such a risk by the advance-party commander. The terrain north of the hill is open and, therefore, offers neither cover nor concealment. The location of the hostile resistance is indefinite. But as the dragoons had been fired on when they reached the crest of the hill, this resistance must be so located that fire can be brought to bear on it from the hill. Accordingly, part of the advance party should be placed in position on the hill to cover the rapid maneuver of the remainder towards Suxy.

(2) The support proper, including the battalion's two machine guns, is only 225 yards behind the advance party. In a few moments the support will have to halt or go into action. Just as soon as the support commander learns of the situation in his front he should move his machine guns into position on the high ground south of Suxy with the mission of covering the advance over the open ground north of the forest. The support proper, less a small reserve, should be deployed into small columns and moved forward rapidly toward Suxy, and the small reserve halted under cover of the hill where it will be available for further developments.

HISTORICAL SOLUTION

The advance-party commander placed his leading platoon on the crest, astride the road, ready to open fire. He ordered one platoon to move down the slope at the double time and turn the village on the right, and the remaining

*Not the historical solution.

platoon to move similarly and approach it from the left.

As this maneuver is under way, a platoon of field gray cavalry mounts up in the vicinity of Suxy and, before the French can intercept it, gallops off by way of the ravine to the east.

The platoon of the advance party that is in position on the crest south of the town then moves forward promptly.

Some inhabitants say that a German cavalry squadron (about the size of our troop) had been billeted for the past eight days in a chateau one kilometer to the east.

The German plane is still observing the column.

About 11:00 AM the point of the advance guard emerges from Lower Heveau Woods on to the plateau southwest of Neufchateau. The dragoons, listening, report to the advance-party commander that they can hear, from the direction of Neufchateau, sounds quite different from those normal to a small town. It sounds, they say, like a large column of vehicles moving on the Neufchateau —Bertrix Road, going from east to west.

The dragoons push on. But at the bridge about 1650 yards north of Montplainchamp they are fired on by riflemen, apparently in or near the two houses 500 yards beyond the bridge. At the same time the officer command-

ing the dragoons sees what he believes to be part of a German column moving westward from Neufchateau. However, the hill north of the bridge obstructs his view somewhat, and he is not sure. Just then a noncommissioned officer, two privates, and several horses are hit, and the detachment whirls and gallops back to the cover of the advance party. The leader of the dragoons reports to the advance-party commander what has happened and what he has just seen.

The advance party continues forward on the road. But as the point crosses the bridge it also receives a few scattered rifle shots from the vicinity of the houses northeast of the bridge. The billeting detail of the 23d Infantry, eager to locate food and beds in Neufchateau, arrives at this moment at the head of the advance party. They say, when asked, that nothing has been heard from the column on the right—consisting of the 3d Colonial Division and Corps Artillery—that was to move on Neufchateau via Breuvanne, Rossignol and Les Fosses.

The Neufchateau stream is fordable.

FIFTH REQUIREMENT

(1) The plan of the advance-party commander for continuing the advance.

(2) The plan of the support commander for continuing the advance.

HISTORICAL SOLUTION

The support commander heard the firing and went forward to join the advance-party commander. He arrived at the head of the advance party and got in touch with its leader just after the billeting detail arrived. The support commander believed that there was "only cavalry" in the vicinity, and he therefore decided to have the advance party cross the bridge at the double and in one bound go on into Neufchateau.

He ordered the leading platoon of the support proper to leave the column at the bridge and climb the hill to the north.

DISCUSSION

(1) The high ground to the north commands the surrounding terrain and the bridge. Consequently it is vital that the French secure this high ground immediately.

A squad or two of the leading platoon can take position near the bridge to cover the crossing of the remainder of the advance party. The leading platoon, less the covering force, should then cross the stream rapidly and drive out the riflemen near the two houses. At the same time at least one squad of the advance party should go to Ospot Woods, then follow the northern edge of the woods to Neufchateau. When the resistance near the houses is reduced, the remainder of the advance party can cross the stream and move northwest with the mission of securing the high ground overlooking the bridge. The covering troops south of the bridge should rejoin their platoon, and this platoon then continue on to Neufchateau along the road.

Of course, if unexpected developments arise while this plan is being put into operation, it may be altered to meet them. Thus the resistance at the houses might prove to be more than a few riflemen, requiring more troops to overcome it. The plan adopted, however, must provide for

reducing the resistance encountered and securing the high ground north of the bridge.

(2) Beginning at the bridge the route of march passes through a wide defile, flanked on the north by the hill and on the south by Ospot Woods. If the enemy occupies either or both of these places, the march will necessarily be stopped until he is driven off. Consequently the support commander should be particularly concerned about them.

As soon as he learns of the firing near the bridge, the support commander should go forward to look over the ground and learn the plan of the advance-party commander.

Assuming that he did this, he should then order the dragoons to move at once to Ospot Woods, and, proceeding along the northern edge, cover the movement north of the bridge. The fourth platoon of the advance party company should now rejoin its company. With this added strength the advance party can secure the hill north of the bridge and cover the movement into Neufchateau. One platoon of the remaining company (2d Company) of the support proper should proceed to Ospot Woods with the same mission given to the dragoons. And the two machine guns should undoubtedly go into action at once in the nearest available position to cover the crossing of the stream. The 2d Company, less the platoon sent to Ospot Woods, should cross the stream as soon as practicable, and move to the two houses northeast of the bridge. If no resistance develops by this time, this company, less the platoon, can partially deploy and move astride the route of march on Neufchateau. The machine guns, of course, should displace to the high ground north of the bridge as soon as the situation permits.

Any plan the support commander adopts at this time should provide for holding the high ground north of the bridge and for reconnaissance of Ospot Woods, so close is it to the line of march.

As the advance party clears the bridge it deploys in a line of skirmishers with three platoons abreast—one platoon astride the road, the other two on its left. The intervals between men are wide, so wide in fact that the left of the advance party, after deployment, is almost on the crest of the hill.

The two houses northeast of the bridge are found sealed and locked. Inhabitants and enemy are both gone.

The firing now ceases. But as the platoons deploy and advance a rumbling is heard, as though a large number of vehicles were moving on the road north of the hill. The advance-party commander joins the left platoon and moves to the crest of the hill. From there he sees the town of Neufchateau. Its streets are deserted. But about 900 yards away, on the road running west from Neufchateau, he sees the tail of a column of vehicles moving west. Near it he sees a German cavalry squadron resting.

SIXTH REQUIREMENT

Plan of the advance party commander to meet this situation.

HISTORICAL SOLUTION

The left and center platoons of the advance party, moving on Neufchateau, suddenly changed direction and moved rapidly towards the crest of the hill to the north. In a few moments these platoons opened fire on the resting cavalry. Only the third platoon of the advance party continued toward Neufchateau, deployed astride the road.

The action taken by the advance party commander here shows that he fully recognized the importance of the high ground north of the hill and that he appreciated the necessity of driving the German cavalry away and holding the hill. The sudden and heavy fire of the two platoons of the advance party proved very effective, for the German cavalry made their getaway with speed and considerable confusion.

Apparently the fire of the two platoons on the hill to the north is not being returned.

The support proper—now only one company (the 2d) and two machine guns—is under cover near the houses 500 yards northeast of the bridge. No word has yet been received from the 3d Colonial Division on the right or the XII Corps on the left. The support commander is in the vicinity of the two houses and has just witnessed the action of the advance party.

SEVENTH REQUIREMENT

Actions, messages, and orders of the commander of the support proper at this time.

A SOLUTION

The support commander should realize by now the importance to his brigade of the high ground to the north, and reinforce the troops there. One rifle platoon and the two machine guns are sufficient reinforcement until he learns what is north of the hill. The support commander should immediately gallop to the hill to see for himself what is taking place, and then promptly inform the advance-guard commander of the situation and of the action he has taken.

It is probably too late now for the support commander to concern himself about the Ospot Woods, for his whole force is north of Neufchateau stream, nearly all of it strung out along the road. But the presence of a long column of vehicles moving west towards Bertrix ought to attract his attention to the area west of the hill, and he should immediately provide for reconnaissance in that direction.

When he has personally learned of the situation north of the hill, the support commander should promptly push the company near the houses on towards Neufchateau. Neufchateau is the march objective for the day and, unless directed otherwise by the advance-guard commander, the situation does not seem to warrant his failure to try, at least, to get troops on into the town. The one platoon that was advancing on Neufchateau seems hardly sufficient for this.

It is not known what the support commander did in the situation just presented. However, by 12:00 noon, a half-hour after the platoons on the hill west of Neufchateau had

opened fire, the situation, as known to the support commander, was as follows:

When the platoon moving on Neufchateau arrived within a few hundred yards of the town, a German rifle company debouched from the town, quickly deployed and opened an accurate and effective fire on the platoon. Within a few minutes other riflemen moved into position on the right and left of the German firing line and joined in the fire fight with the French platoon. Soon the French platoon was forced to withdraw a few hundred yards to the west.

The other two platoons of the advance party, and the platoon of the 2d Company that the support commander had sent to the hill, are still there; and the two machine guns are moving to join them. Firing there has ceased. The exact location of the dragoons is not known, but they are thought to be somewhere near Neufchateau.

German infantry with machine guns is in the western edge of Ospot Woods. Firing is heard way to the south of that woods. And a German battery apparently located in White Stone Woods is firing on the bridge over the Neufchateau stream.

The remaining company (the 2d) of the support proper is still under cover just east of the two houses 500 yards northeast of the bridge.

All that is known of the reserve of the advance guard at this time is that it has not yet reached the bridge.

The support commander is in the vicinity of the two houses.

EIGHTH REQUIREMENT

The plan of the support commander for the use of the support proper (2d Company) in this situation.

HISTORICAL SOLUTION

The support commander directed the 2d Company, which was under cover just east of the two houses, to take up a position on the right of the platoon that had been driven back from Neufchateau.

He urgently requested the advance guard commander to send forward the other two companies of the 1st Battalion which were marching at the head of the reserve of the advance guard.

DISCUSSION

The support commander was now in a difficult situation. Machine guns known to be in the Ospot Woods swept the ground over which his remaining company would have to pass either to reach Neufchateau or the high ground north of the bridge. More than a German rifle company held the western edge of Neufchateau. Somewhere to the west artillery was firing on the bridge. Apparently a fight was taking place south of the Ospot Woods. In all probability the reserve, in whole or in part, was engaged there. The presence of machine guns indicated at least a German regiment; for in the German army the machine gun was a regimental weapon. Artillery to the west indicated considerable cavalry or infantry. The situation on the hill seemed satisfactory because firing there had stopped.

If he puts his 2d Company in against Neufchateau it will have to have heavy fire support not only on the German riflemen defending the town but on Ospot Woods. The machine guns there, if not kept down, can seriously interfere with any movement towards the town. On the other hand, if the company is held under cover pending developments in the situation, the Neufchateau Germans, covered

by fire from Ospot Woods, may advance and, in conjunction with troops coming from the west, cut off that part of the battalion north of the Neufchateau stream.

More troops are needed north of the bridge.

A solution that seems to meet the situation as it was known to the support commander is to have the advance party commander, who is on the hill, place the two machine guns in position to fire on the Ospot Woods; under cover of their fire to have the rifle company near the houses send three of its platoons to join the platoon that had fallen back from Neufchateau, and dig in; to have the advance-party commander immediately send one of the platoons now on the hill to the vicinity of the two houses northeast of the bridge, and have him continue to hold the hill and also reconnoiter White Stone Woods west of it; to hold the platoon of the 2d Company and the platoon of the 1st Company that is to report to the houses, as a reserve; and to request that the other two companies of the battalion be sent forward at once.

About 12:20 PM one of these companies reports to the support commander at the houses 500 yards northeast of the bridge. The company commander states that the other company of the 1st Battalion, which was with the reserve, had turned out of column about a mile to the south; he does not know why.

Firing south of Ospot Woods is increasing. There is no firing north of the stream except that of the artillery firing on the bridge.

NINTH REQUIREMENT

The plan of the support commander for employing the company that has just reported to him.

HISTORICAL SOLUTION

The support commander sent the company, less one platoon, directly to the high ground north of the two houses. He ordered the remaining platoon to take position as a local reserve in rear of the left of the line that faced Neufchateau.

As these units moved out, they came under heavy small-arms fire from Neufchateau and Ospot Woods. Although losses were severe the units managed to reach their objectives.

DISCUSSION

Assuming the dispositions to be those actually made by the support commander—he had held out no reserve—the bulk of the company that reported to him about 12:20 PM should be held near the houses for the time being. It is now apparent that at least part of the reserve of the advance guard is being engaged somewhere to the south. Therefore, it cannot be counted on for assistance in the near future. The immediate problem seems to be to hold the hill north of the bridge. At any moment it is liable to be attacked from the east, the north, or the west, or from all three directions simultaneously. The failure of the Germans west of Neufchateau to advance may mean that they are not going to advance or that a maneuver to cut off the troops north of the stream is under way. Because thus far no German infantry has appeared from the west does not mean that none is on the way. Prompt reconnaissance towards the White Stone Woods by a platoon of the company that has just reported would help to clear this up.

Consequently, one platoon should be given this mission and the company, less this platoon, should be held under cover near the two houses. Lacking, as the French did, any intelligence agencies with the battalion, the support commander might well use a few of the scouts of this

company to establish battalion observation posts on the roofs or in the upper stories of the houses and on the hill.

Since he is still ignorant of what is taking place south of the Ospot Woods, he should send an officer back to ascertain the situation there.

EPILOGUE

What actually occurred at Neufchateau? The advance guard of the 5th Brigade had unexpectedly collided with

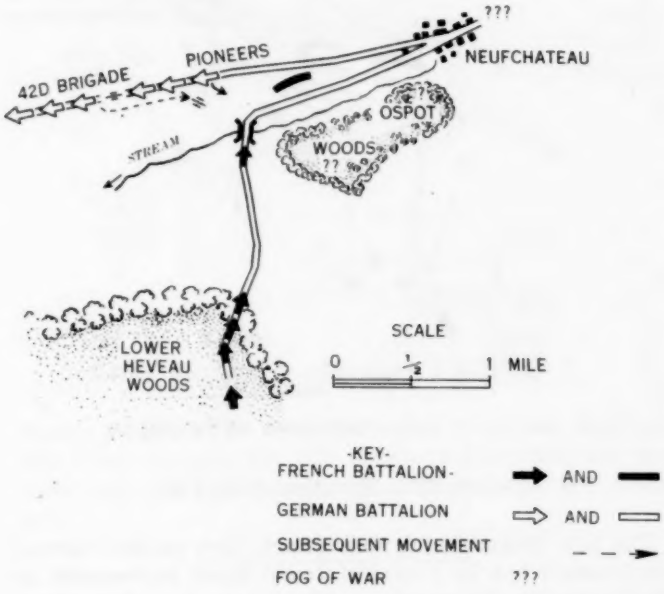


FIGURE 18.—Situation 11:30 AM

the German XVIII Reserve Corps moving west through Neufchateau. By about 11:30 AM, the situation was as

depicted in Figure 18. The French advance party had fired into the rear of the German 42d Brigade. A German pioneer battalion of this brigade halted in White Stone Woods and the artillery with it turned out of column. The remainder of the German brigade continued westward, and a short time later bumped into the French XII Corps.

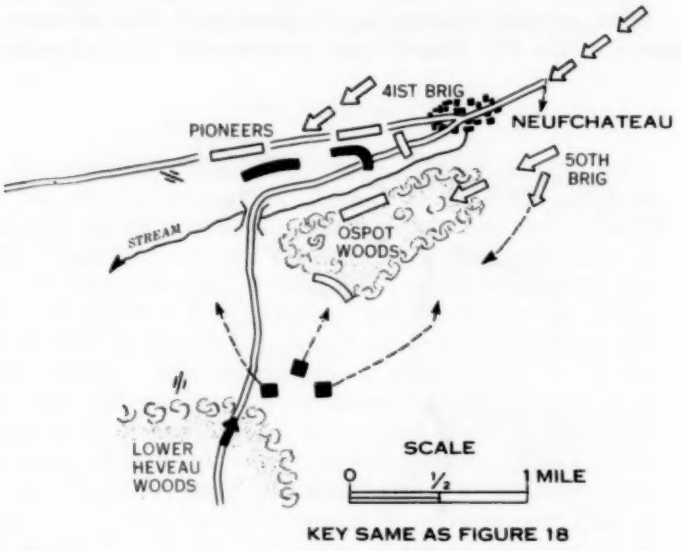


FIGURE 19.—Situation 1:00 PM

The 5th Brigade's advance guard then pushed toward Neufchateau but by 1:00 PM found itself surrounded on three sides by the remaining three brigades of the German XVIII Reserve Corps. (See Figure 19.)

The 1st Battalion of the French 23d Infantry was wiped out and only a small fraction of its 2d Battalion was able to pull back. Although the Germans succeeded in almost annihilating the French advance guard and in

driving the main body of 5th Brigade back to positions shown in Figure 20, the French held on until about dark. Then, after having lost about fifty percent of their effectives they withdrew during the night to Jamoigne, just south of the Semoy River, but "not owing to any

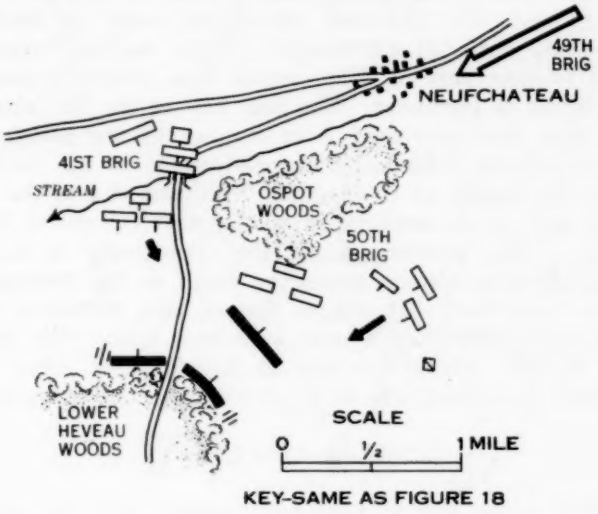


FIGURE 20.—Situation 5:30 PM.

enemy action, (The Germans failed to exploit their success.) but because the XII Corps on their left had gone back and the 3d Division on its right was not coming on".

The 3d Colonial Division—the right column of the corps—was not coming on because it was engaged in a desperate fight in and about Rossignol.

This division and the Corps Artillery were to march

on Neufchateau via the St. Vincent-Breuvanne-Rossignol-Les Fosses road. All went well until the head of the column entered the forest about a mile north of Rossignol. (See Figure 21.) There it was stopped by Germans deployed astride the forest road. While the advance guard was endeavoring to clear the way through the forest, the Germans, advancing south in several columns, encircled the flanks of the leading brigade. The greater part of this brigade was either destroyed or forced to surrender. The rear half of the 3d Colonial Division was prevented from coming to the assistance of its leading brigade by the destruction of the bridges over the Semoy at Breuvanne. This was due to the cooperation of the artillery of still another column of Germans. This artillery seized the opportunity to assist a neighboring column advancing south on the Rossignol-Breuvanne road. It opened fire on and destroyed the Breuvanne bridge at a most opportune time. The story of the 3d Colonial Division at Rossignol is, from the French viewpoint, one of the most tragic of the war.

GENERAL DISCUSSION

This action around Rossignol, coupled with the action of the 5th Colonial Brigade, as brought out in this problem, clearly demonstrates a complete failure on the part of the French high commanders to properly use their mobile reconnaissance agencies. This neglect caused them to fail to establish the fact that contact with the enemy had become imminent. On the morning of August 22d, contact with the enemy was indeed imminent, yet the French believed that the march that day would be made with but little opposition.

It is true that the high commanders had at their disposal only a small cavalry force, very little aviation, and no armored cars or combat cars. (Nevertheless there was enough information at hand to indicate clearly that the enemy was close.) It is true, also, that aviation

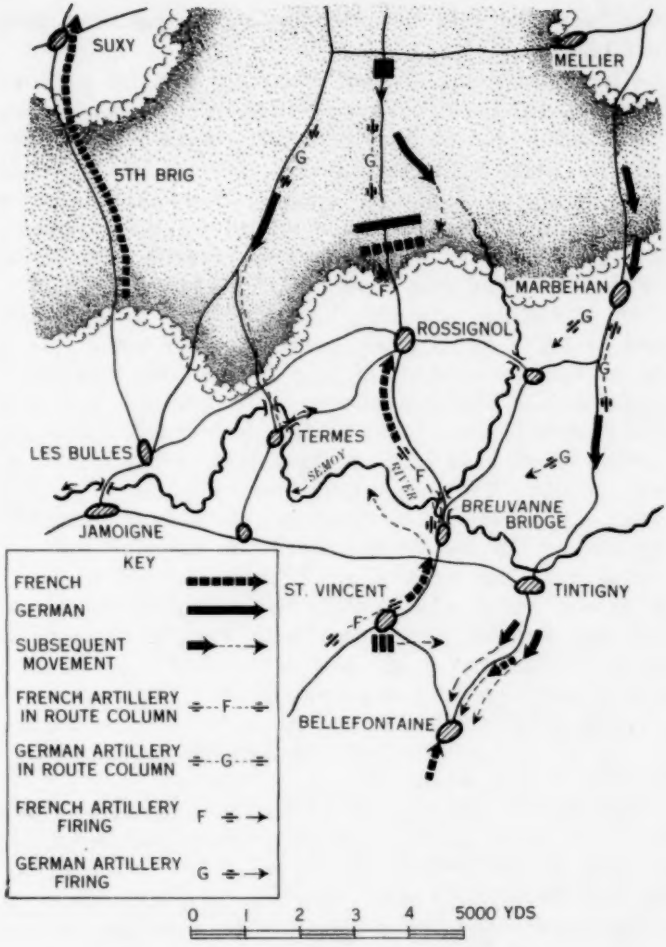


FIGURE 21.—Situation 9:30 AM

was new and that its reconnaissance capabilities were not realized.

These conditions are not likely to exist in a future war. With present day aviation, air reconnaissance would have been at least two day's march ahead of the Fourth Army. Likewise, motor reconnaissance would have been at least one day's march ahead of the marching troops. The information gained by these agencies would probably have prevented the French from going blindly, headlong into strong German forces.

On the other hand, the Germans used their cavalry and at least one airplane to locate the French. As a result they established the fact that contact was imminent; and at both Neufchateau and Rossignol they met the French columns with partial deployment. This resulted, as we have seen, in the defeat of the French at both places. The same thing was happening, on the same day, all along the frontier. These initial reverses brought on the first French retreat to the Marne River.

Had the French Third and Fourth Armies advanced in parallel zones with partially deployed advance guards and met German deployment with French deployment, the initial reverses would have been averted, or at least would have been far less serious in their consequences.

Let us study the terrain as shown on the map, Figure 15, as it might have been used under the conditions existing on August 22, 1914.

Suppose that the Colonial Corps (3d Division and 5th Brigade) in its advance on Neufchateau had advanced in three parallel brigade zones, the left boundary of the left zone being the Vierre River and the right boundary of the right zone being a line from near Tintigny to the vicinity of Offaing.

This would center the right zone on Rossignol, the center zone on Termes, and the zone of the 5th Brigade on Les Bulles.

Successive phase lines could have been designated:

(1) The Semoy River.

(2) Southern edge of forests about a mile or more north of Rossignol and Les Bulles.

(3) Series of hills running east from the hill a little more than a mile south of Suxy.

(4) The spur just north of Suxy to Les Fosses.

Others to be designated later.

Had the advance been coordinated within the corps so that each advance guard would reach and leave each phase line at approximately the same time, it is hard to believe that the disaster at Rossignol could have occurred.

The center brigade would have been able to turn the Germans from the west by occupying the high ground to the west of the town. It is entirely probable that Rossignol would have been a French victory, with the Germans driven to the east to positions in front of the II Corps, which was moving north echeloned to the right rear. And in all probability, too, the entire Colonial Corps would have been able to reach Neufchateau as planned.

Even if the French had not won at Rossignol and the battle had been a draw, the 5th Brigade would certainly have been warned that Germans in force were in close proximity. But owing to the complete lack of coordination between advance guards, the 5th Brigade, completely unaware of the utter defeat of the 3d Division at Rossignol, continued on to Neufchateau where the same fate awaited it.

Let us return to the advance of the 5th Brigade, and particularly its advance guard action, under the assumption that it was to advance in a zone partially deployed.

As the advance guard left Les Bulles, it should have been partially deployed until it reached the southern edge of the forest. Here, although contact is imminent, the advance guard may be forced to revert to column formation because of dense underbrush. But

this does not mean to a column on the road. (See "A Solution" of Third Requirement.)

As it arrived at the edge of the forest south of Suxy, the advance guard should again adopt a partially deployed formation to cross the open space to the edge of the forest north of Suxy. At this point it may again be forced to revert to a less dispersed formation. But when it arrived at Montplainchamp it should again partially deploy astride the road to Neufchateau, covering a zone of approximately 900 yards on each side of the road. This formation would cover the nose running generally southwest from Neufchateau and the high ground in the western edge of the Ospot Woods.

Such an advance on Neufchateau would have uncovered the German resistance in Ospot Woods. The advance-guard commander could then have taken steps to drive it out or at least develop it for the main body. It would have developed, also, the situation to the north of the road. And the brigade would have been able at least to hold, with far smaller losses, the high ground south of Neufchateau stream, even if it were not able to capture Neufchateau, its "march" objective for the day.

CONCLUSION

While the Colonial Corps was being torn asunder at Neufchateau and Rossignol, other French advance units were fighting desperately at Ethe and Virton to the southeast, and at Bertrix to the northwest. All these classic meeting engagements resulted in French disasters; for in each case the French were suddenly and unexpectedly struck by large German forces better developed for combat.

What were the causes of French defeat. It was not lack of gallantry, for in many instances the French

sustained the shock of the German divisions through sheer tenacity and determination. It was not numerical inferiority, because on some battlefields the French outnumbered the Germans.

Why failure, then? "Although there were several causes for the disastrous results of that day (August 22, 1914) the French attribute the defeat in large part to the inefficient manner in which their advanced guards carried out the missions of security and reconnaissance. The failure, they insist, was not primarily due to lack of training or experience on the part of advance-guard commanders and their troops, but to the advance-guard *formation* itself. The advance guards were still in column when contact with the enemy took place. But when they endeavored to develop the opposing forces they found themselves already outflanked on one or both sides; . . . The French columns were separated, utterly confused, and well nigh routed."

Therefore, it behooves a commander by all means to determine the area of imminent contact. When he enters that area, his advance guards should not be in the convenient point-advance party-support formation but should be advancing in adjacent zones, each advance guard partly deployed and covering the entire width of its zone. Thus lateral communication, so vital to success, is maintained and the advance of all columns coordinated; and when hostile resistance is encountered the force necessary to counteract it can be promptly employed.

Designated zones of advance and coordinating phase line would have kept the 3d Colonial Division from being caught astride the Semoy and would have averted the retreat of the 5th Brigade from Neufchateau.

---

*Chapter VII, Volume VIII, The Infantry School Mailing List.

CHAPTER III

Military English

EXACTNESS OF MEANING

The regimental adjutant who concluded an early morning march order with, "The sun will rise at 5:16 AM. By order of Colonel Ducrot." has long since become legendary. But he forms only one of a long succession. Before him and after him there have been writers of orders and messages whose failure to use language accurately has unhappily not been confined in its results to a good laugh on the part of a garrison in time of peace, but has actually caused the loss of battles and even wars.

On June 23, 1863, Lee wrote Stuart a letter of instructions. The Confederate commander was already beginning the movement of his army northward into Pennsylvania and had, a day or two before, discussed various plans for the use of his cavalry with its leader, Stuart. And so, when Colonel Charles Marshall, Lee's aide de camp, read to Lee the letter of instructions before it was dispatched to Stuart, they both felt, apparently, that it was clearly worded. Both believed that Stuart would understand exactly what was intended by the sentence, "You will . . . cross the river east of the (Blue Ridge) mountains." By this Lee meant, "You will cross the river to the east, rather than the west, of the mountains", and thus by inference, "You will cross *just* to the east of the mountains."

But, this sentence as worded in the original letter of

instructions admits an entirely different interpretation. To Stuart "east of the mountains" meant the full sweep of the Atlantic seaboard—freedom to go tearing off with his hard-riding cavalry even to the outskirts of Baltimore seventy miles away, if he thought it could be done. And in a few hours he and his squadrons had departed on just such a raid. Stuart, sweeping far to the east and north, left the rest of Lee's army, as it moved into Pennsylvania, without a reconnaissance agency capable of covering the Confederate movement or learning that the Union army was also thrusting north.

Military critics are agreed that Stuart's absence was the deciding factor in the Gettysburg campaign. He was gone, and Lee was consequently blind to his enemies' activity for a week; while Union forces, on the other hand, were well aware what Lee was doing. And the loss of the Gettysburg campaign may well have meant the loss of the War to the South.

In commenting on Lee's letter of instructions, Major General Sir Frederick Maurice, who edited Colonel Marshall's papers in An Aide-De-Camp of Lee, says: "In view of the great importance which Lee attached to having Stuart on his flank, it would have been better to have told Stuart specifically that if he crossed the Potomac east of the Blue Ridge at all it must be by the fords near the mountains, so that he could rejoin the army quickly . . . The general conclusion to be drawn . . . is that military orders cannot be too simple, clear, and definite."

Elsewhere, General Maurice himself stumbles into a common pitfall of military language when he suggests that what Lee really meant was "that Stuart was to cross *immediately* east of the mountains". To the dashing Stuart, in his perpetual haste to be away with his troopers, circling far in rear of the Northern forces, and when possible, around them, "immediately" could have meant only one thing—an order to the trumpeter to sound "boots and saddles". "Immediately", in fact,

is for that very reason, one of a number of treacherous and dangerous words that should never be used in military orders. For its time sense and its place sense are much too possible of confusion. "You will move immediately across the Upatoi" can mean "You will move at once across the Upatoi", or "You will move just across the Upatoi". One of the two latter, and never the first, should be used. Nine times out of ten, perhaps, there will be no misunderstanding. But the tenth may mean another Gettysburg.

Greater, indeed, than that of Gettysburg would have been the effect on the world's history if the German break-through of 1918 had succeeded. But by great good fortune the careless use of military language, although it contributed heavily to losing the Battle of St. Quentin and permitting the March Drive thus to gain momentum, did not quite lose the war.

Here, the instructions sent by GHQ to Gough, commanding the Fifth British Army, which bore the weight of the first German onslaught, were at fault. He was told in one place that "we should make our perparations to fight (defensively) east of the Somme"; and again in the same instructions, "it may well be desirable to fall back to the rearward defences of Peronne and the Somme."

In the first place both of these directives are feebly and hazily phrased. Actually, they are not worded like orders at all but like suggestions. Suggestions from the General Staff may be intended as the equivalent of orders, and even accepted as such, as, indeed, they were in this case. But that is at best an assumption and a custom which can only lead to misapprehension; for how can a subordinate tell when a suggestion is in fact only a suggestion, and not an order?

There is only one clear way to write this order, and that is to say: *You will prepare to defend* (not "fight")

just to the east of (not merely "east of") *the Somme;* and: *You will* (not "it may well be desirable to") *fall back to the rearward defences of Peronne and the Somme.* Moreover, in both of these directives, it would have been just as easy for the British General Staff to indicate a specific line of defence, instead of using the vague terms "east of" and "rearward". It might have taken a staff officer three minutes to glance at the map and read off the names of a few towns, but that is all. The orders would then have been clear direct, and foolproof.

But in this case there was confusion upon confusion. These two sets of instructions we have just examined were not only inexact, and indefinite, and hence debatable as to meaning—as well as being weakly expressed; they were also in a measure contradictory. At least they could be taken as such, because they directed Gough to get ready to defend at two different places. And to this day it is not certain whether the General Staff intended this to be done.

The net result was, however, that Gough ran his already tired troops half to death in an attempt to work first on one system of defences and then the other. In consequence neither job was well done. This, and the general air of uncertainty as to what was next to be done that permeated the Fifth Army from above, contributed mainly to the ultimate retreat.

Captain Liddell Hart's comment on this particular situation is exactly to the point. He writes, in A History of the World War: "The fog of war is bad enough without being thickened by obscure phrasing: battles may be lost by lack of lucidity as well as by lack of tenacity."

These two examples illustrate better than any others of modern wars the absolute necessity for exactness and perfect clarity in military English. There must

not be the slightest chance of error because of language. Mistakes enough will occur without adding the risk of further mistakes on that account.

And because it is mainly during peace that we form our habits of written expression, it is then that we must guard severely against indeterminate, ambiguous, and cryptic usage in military English. Besides, the clearer we make our regulations and instructional materials—which give us our best practice in military writing—the less the effort required in understanding them; and, again, the less chance there is of misinterpretation, misapplication, and misunderstanding, when war does come.

Here, too, we can hardly do better than quote another passage of Captain Hart's, this time from his article on Infantry in the Encyclopedia Britannica: "The future infantry must be permeated by the best doctrine the War can teach, and this doctrine must be expressed in language so simple and metaphors so clear, that it can be as readily grasped by subalterns and corporals as by general officers. Its manual of instructions should be as intelligible to the Australian bushman as it is to the staff college graduate."

This is strong language. But let us remember that if two orders had been written in words that a rear rank private could have understood, the Confederate forces might have won Gettysburg, and the German drive of 1918 might have been stopped by one stout set of field fortifications instead of overrunning two that were half prepared, and with gathering force, smashing through for 40 miles, almost to Paris.

CHAPTER IV

The Defense During Periods Of Low Visibility

The Third Battle of Ypres lasted approximately three and a half months, and each square mile of mud gained cost the British army 8,222 casualties.

—Article on *Tactics*, Encyclopedia Britannica.

The large-scale daylight attack by infantry is as dead as the men who tried to repeat this traditional process in 1914-1918.

—Captain B. H. Liddell Hart in *The Training of a Modern Army.*

If the second of the foregoing quotations is justified by the first, there remain nevertheless two forms of attack that seem to offer a chance of success in land warfare. The first of these is the adavnce against modern fire defenses with the aid of speed and armor—tanks. And failing such protected high-mobility combat vehicles, infantry has only the alternative of attacking under the cover of some form of obscurity—night, fog, smoke, or woods. Obscurity, so greatly does it hamper the defense, nearly equalizes the odds against the attacker and permits the foot soldier to make advances quite impossible in plain daylight.

In any future war, then, large-scale attacks against defensive positions during periods of limited vision, especially at night, will in all probability occur more often than during the World War. Ways and means to meet

such attacks, including changes in defensive dispositions to counter the effects of limited vision or obscurity, should therefore receive careful consideration before a future war becomes a present one.

During daylight, we organize our defenses so as to break up and stop the attack in front of the battle position by the combined fires of all weapons. These fires begin as soon as the attack comes within observation and range. If the attack succeeds in reaching the battle position, the defense endeavors to repulse it by close combat. If the attackers succeed in entering the position at one or more points, the defense first attempts to eject him by fire, and, failing this, tries to eject him by counterattack. And during all of these several phases of defensive combat, the defender depends to a great extent on observation for tactical information of the enemy and the effectiveness of his fire.

When observation is denied to the defense, the tactical situation becomes obscure, and aimed fires are more or less eliminated from the coordinated defensive fires. The extent of this elimination of aimed fires depends on how greatly vision is limited, and on the degree of efficiency of the artificial means of illumination used. During periods of total blindness, the defense must depend solely on the prearranged fires of fixed weapons. On the other hand, partial visibility, and at night the use of artificial means of illumination, generally permits aimed fire at close ranges. But in either case the effectiveness of the defensive organization is materially reduced. What changes then, can the defense make in the disposition of its units and weapons, and what additional measures of security should it take, during periods of limited vision that will tend to lesson the disadvantages of denied observation? Are these changes and measures the same when observation is denied the defense by any one of the causes of limited vision—night, fog, or smoke?

NIGHT

Just as the darkness of night imposes limitations on the defense, so does it handicap the attacker. One who attacks at night must overcome the difficulties of maintenance of direction, of control and lack of observation, by thorough and detailed preparations and faultless execution. This preparation for the night attack is generally marked by unusual activities within the attacker's line such as increased reconnaissance, troop movements, movements of artillery into position, and artillery registration fires. The attacker nevertheless makes every effort to insure the secrecy of these preparations so as not to warn the defense of impending attack. Hence the defense should counteract the "secrecy" precautions of the enemy by alert and vigilant observation, aerial reconnaissance, and thorough intelligence measures. By such means the defense may detect an imminent night attack. And to be forewarned is to be forearmed.

In preparing for its night attack on April 24, 1917, against the Bulgarian lines near Dojran, Greece, the British 26th Division laid several additional telephone lines. This was observed by the Bulgarians who correctly interpreted the activity as foreshadowing a night attack. The Bulgarians installed several large searchlights which illuminated the area of the British advance and contributed in a large measure to the success of the defense in repulsing the British assault.

Again, the night attack of the 2d Brigade, 2d Australian Division against Mouquet Farm (France) on August 29, 1916, resulted in failure primarily because the Germans were forewarned by prior artillery fire.

A third example is one that occurred on November 5, 1916 in France. About 12:30 AM that day two companies of the 1st Battalion, and the bombers of the 3d Battalion, 1st Australian Division, moved forward to

capture a deep sunken road held by the Germans near the village of Flers. But when they reached the German wire entanglements they were received by terrific rifle fire and a shower of bombs; for the Germans had observed the assembly of the Australian troops in their assault positions and had illuminated the battlefield with rockets. Thus the alertness of the defense caused this attack to fail.

However, the enemy does not always play into the defender's hand as in the instances cited. By various ruses and extreme precaution the attacker sometimes bars intelligence of his impending night attack from the defense. During hours of darkness, then, the defense can, only by active patrolling well to the front and establishment of additional small security groups, prevent surprise; and by prompt fire of fixed weapons, cause early deployment by the attacker.

An alert Turkish outpost and active Turkish patrols would have prevented the British performance of the "most remarkable feat of the Palestine Campaign". During the night of December 20-21, 1917, the British crossed the River Auja near where it empties into the Mediterranean Sea, north of Jaffa, to attack the heights held by the Turks north of the river. (Figure 22.)

The river is a formidable obstacle, 40 or 50 feet in width and 10 feet in depth. The Turkish position commanded the lower and flatter ground held by the British to the south. The bar at the mouth, where the river widens to about 120 feet, was the only place where it could be crossed without a military bridge or boats. In preparation for the night crossing, the British made several reconnaissances of the north bank. This would have been well nigh impossible had the Turkish patrolling been

efficient. The reconnaissances were made by swimmers and by officer parties in small boats. On the night of December 14, two officers swam out to sea from the British position south of the river, crossed its mouth and reached

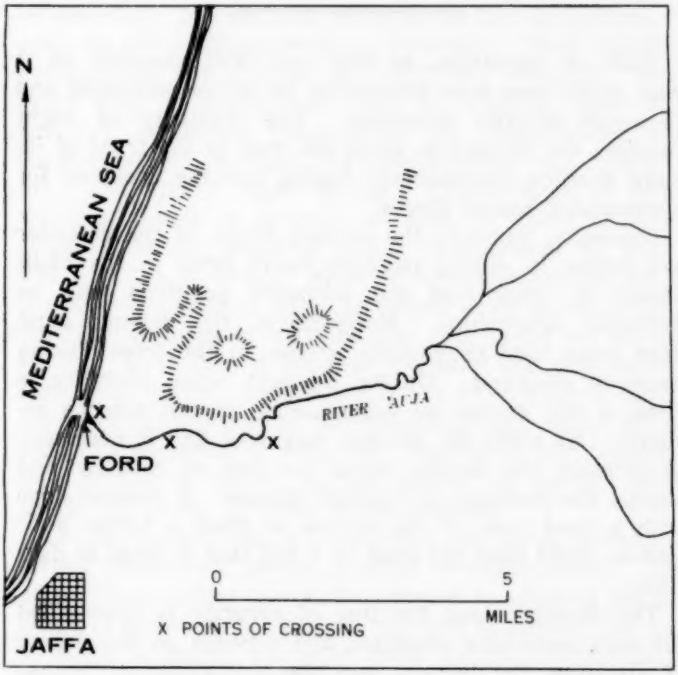


FIGURE 22

the shore behind the Turkish lines. They ascertained the position of the ford, and found that there was about three feet of water in it, and that no obstacles had been placed below the surface. Still undetected by the Turkish sentries, they made their way out through the surf again and swam back. As a result of these reconnaissances, points of crossing were selected. Bridging ma-

terial was moved up and artillery moved into position under the very nose of the Turkish sentries. And on the night of December 20th the British crossed the Auja and successfully stormed the strong Turkish positions before daylight, December 21st.

Such an operation, as bold and well executed as it was, could have been forestalled by active patrolling and thorough security measures. The obscurity of night requires the defense to reach out well to the front of its main position, continuously feeling into the darkness for approaching hostile forces.

Generally, however, the outpost forces of the defender are driven in during daylight hours prior to the night attack in order that the defensive positions may be definitely determined. Nevertheless, the defense must keep some kind of security groups to the front during hours of darkness. During daylight, when visibility is good, a few groups on commanding ground provide security. At night the defense may well find it necessary to increase the density along the line of security and change the positions of daylight groups. A reverse slope with a good view of the skyline is often a better position at night than the crest of a hill that is ideal in daytime.

The density along the line of security is determined for each particular situation, and depends on the degree of visibility, the terrain, and the availability of troops. A line of security with sufficient density is almost bound to disclose a hostile advance that patrols may have failed to detect. Moreover, delaying action by the security groups along this line tends to disrupt the advance and give time for troops on the position to prepare to meet the assault. On the other hand, the number of troops on the line of security should not be increased at night to the extent of materially weakening the main defensive position.

It appears thus far that the defense against this first phase of a night attack—preparation and approach to the defensive position—does not differ from the defense against day attacks, except to call for greater alertness, more active patrolling, and increased density on the line of security. No material changes in the disposition of units on the position itself are indicated. Many detailed preparations for defense at night are necessary, however; such as prearranged fires by machine guns and howitzer weapons, preparations for illuminating the foreground to increase the effectiveness of defensive fires, and special night signals. The location of some weapons should be changed at dark in order to cover more effectively probable routes of approach by night. For example, a covered route of approach leading up to the defensive position might be denied to the enemy during daylight by keeping machine-gun fire placed on its entrance. But after it becomes too dark for observation, such an approach, perhaps, could only be covered by blocking with fire the exit at the defender's end, which would require a relocation of weapons. Sometimes, also, machine guns should be moved farther forward to provide additional fire power in front of the position.

If the attack succeeds in reaching the battle position, a second phase—the period of close combat—begins. The attack may, during this phase, succeed in entering the position at some points although repulsed at others. By day or night, of course, attacking units will find it difficult to take by assault strong combat groups capable of all-around defense. On the other hand, the intervals or gaps between such groups ordinarily offer easier access into the defensive position, particularly at night, when limited visibility reduces the effectiveness of the defenders' fire. In the daytime, for example, an interval between two front-line combat groups might be closed to the enemy by fire from a combat group on the support line or battalion reserve line; whereas at night, owing to limited vision and

covered routes of approach, the same interval might become an excellent and easy route of access to the defensive sector.

The question now arises whether additional combat groups or small detached posts should be placed in these intervals at night in order to block entrance more ef-

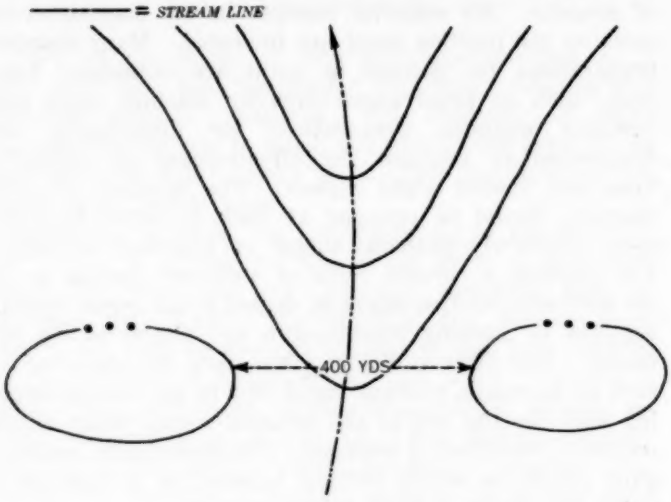


FIGURE 23

fectively. If this is done, the troops to form these detached posts or additional combat groups must be taken either from front-line combat groups, or from combat groups on the reserve line, thus reducing the defensive strength of these groups. When an interval between front-line combat groups is a wide, open ravine ineffectively covered by defensive fire, permitting easy access at night by large numbers of the enemy, it may be advisable to take troops from other parts of the position to form an additional group for the interval. (Figure 23.)

If, however, the interval is covered by defensive fires from one or more combat groups—preferably from those on the support or battalion reserve line—and is narrow, thus limiting a possible penetration to small hostile groups only, it may be better not to reduce other combat groups to provide protection for the interval, but rather to risk a minor penetration by the enemy. (Figure 24.) For if

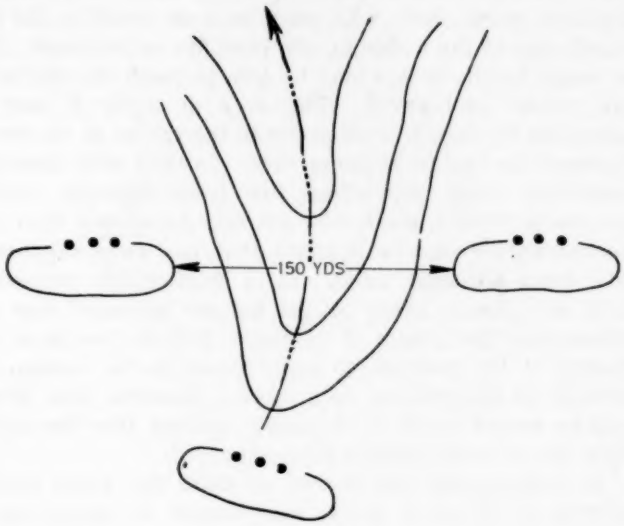


FIGURE 24

the combat groups on either side of, and in rear of, such a penetration hold their positions, the hostile units are likely to find, when visibility improves, that the ground they have taken during darkness is untenable because of the effectiveness of infantry fire by day. And if this fire fails to drive them from the position, the defense still has the advantage of counterattack.

Careful consideration must always be given to the strength and composition of night combat groups or de-

tached posts and the source of troops that are to compose them. The nature of the terrain will influence strength and composition. In wooded terrain with poor fields of fire, more and smaller combat groups are needed than in open terrain. Thus Figure 25 shows a fairly wide, wooded ravine between two front-line combat groups, with a support group, some distance to the rear, covering the interval. Such dispositions may be wholly satisfactory during daylight, particularly with machine guns covering the forward edge of the woods by observed fire as indicated. But at night hostile troops may be able to reach the shelter of the woods unobserved. Therefore at night it may be advisable to place a small group in the ravine in the woods between the two front-line groups. In very wide intervals, especially when supporting fire from adjacent combat groups is limited, more strength may be needed than in a comparatively narrow interval that has good supporting fire from adjacent units. It is particularly important that any change made in the defense at night does not disarrange the system of defensive fires to the front and flanks of the position to such extent as to weaken the defense of the position as a whole. Machine guns should not be moved unless it is clearly evident that the defensive fire of these guns is thus improved.

In determining the source of units for night combat groups or detached posts, care should be taken not to weaken combat groups covering the most probable routes of enemy approach by night. It is also important to maintain depth in the defense and to have reserves—especially the battalion reserve—on hand to occupy their prepared combat positions as soon as information of the enemy attack is received. The withdrawal of any part of the battalion reserve for use in front-line combat groups during periods of limited visibility may not only weaken materially the defensive fires of the position, but may find the defender at a disadvantage when visibiltiy improves, because of his failure to maintain depth in the defense. Therefore, changes made in the defense to meet

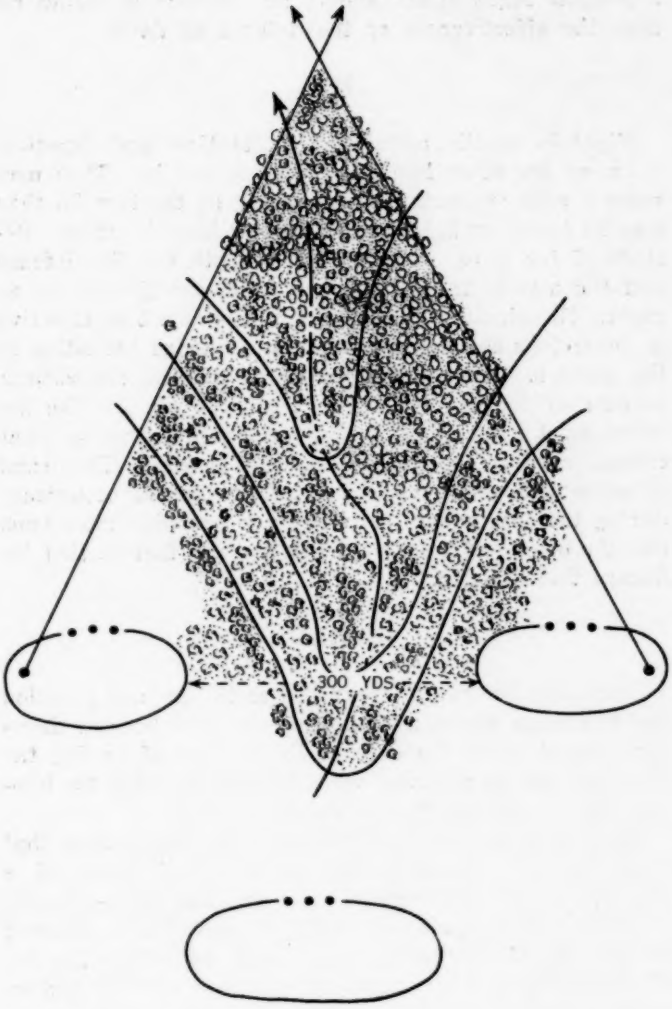


FIGURE 25

a possible night attack should not be such as would reduce the effectiveness of the defense at dawn.

FOG

Night is usually certain as to its time and duration. Fogs, on the other hand, are very uncertain. They may cover a wide or small area depending on the terrain, they may be heavy or light, or of short or long duration. Periods of fog have, in some degree, both for the defense and the attack, the same advantages and limitations as night. Illumination by artificial means is not as effective in dense fogs as at night, which is an added limitation in the defense. Any changes made in defense dispositions because of fog are similar to those for night. The defense must determine in each case when, and to what extent, night dispositions should be taken. The usual duration of fogs in the locality, their time of occurrence during the day, enemy activities and probable intentions, and the degree of density of the fog, are factors that influence this decision.

SMOKE

Smoke screens can be controlled as to time and duration and in a large degree as to extent. An attacker can therefore impose upon the defense by the use of smoke, the disadvantages of darkness while largely retaining for himself the advantages of good vision.

Tests made at the Chemical Warfare School show that when smoke is placed on, or immediately in front of, a position, the effectiveness of rifle and automatic-rifle fire from that position is about eight per cent of that obtained without smoke. Although smoke does not affect the fire of machine guns when these guns are laid and clamped on predetermined lines, it has about the same effect on observed machine-gun fire as it has on the rifle and automatic rifle. Since the 37-mm gun is designed to fire on

small definite targets, observation of fire is necessary to obtain hits. An effective smoke screen therefore practically nullifies the fire of this weapon. Fire from the infantry mortar is not affected when predetermined firing data is used, except for the corrections obtained by observation. But smoke often denies information as to when this prearranged fire should be executed.

Smoke, therefore, insofar as aimed fire is concerned, imposes upon the defense much the same limitations as night. The attack may also, by screening observation posts with smoke, deny to the defense important information of the tactical situation. Consequently, the particular advantages that the attack can hope to gain by smoke are: denial to the defense of observed fire, thus permitting a more rapid advance with fewer casualties; and doubt on the part of the defense as to the direction of attack.

The correct use of smoke is not simple, however. Its use calls for well-trained units. If not correctly used it may benefit the defense more than the attack. For example: a change in wind direction may shift the cloud upon the attack, seriously interfering with the control and movement of the attacking units. A smoke screen also attracts the attention of the defense and places it on the alert.

Generally the attacker has insufficient weapons or ammunition to cover the entire defensive position with smoke. Hence he places it where he thinks it is of greatest benefit to him, as for example, in front of a battalion or company area, the fire from which he desires to neutralize, or from which he desires to conceal his direction of attack. The enemy situation in this particular sector then becomes obscure, and aimed fire from the position is denied.

Now, since conditions similar to night exist, should the defense take up night dispositions? Here, the defender is uncertain whether an attack is being directed against him; and if so, how long the attack will maintain the

smoke screen. Will it be maintained until attacking units reach the defensive position; or will it be cleared prior to the hostile assault? In the latter event the defense can meet the assault with restored vision and without change in dispositions. We find, therefore, that an effective smoke screen laid in front of a defensive position gives to the attack the advantage of a night attack, but not the limitations of one, because the attacker controls the duration of the screen. On the other hand, we find the limitations imposed upon the defense are similar to those imposed by night, with the added limitation that smoke cannot be illuminated by artificial means. The defense must therefore, as in fog, decide from an estimate of the situation to what extent night dispositions should be taken up to meet the threat of the attack. This decision is influenced by the extent and effectiveness of the smoke screen, its probable duration in view of atmospheric conditions, and the probable intentions of the enemy.

CONCLUSION

As few changes as practicable should be made in defensive dispositions in order to meet the altered conditions imposed by reduced visibility. It must be recognized, however, that some changes are usually necessary, especially at night.

Night demands increased patrolling and a rearrangement of, and even an increased density along, the line of security. Means of illuminating the area in front of the defensive poistion should be provided.

The establishment of additional and temporary combat groups or detached posts may be essential to prevent penetration of an area which, although effectively covered by fire during daylight, cannot be so covered at night. The tendency, however, to increase unduly the number of such combat groups must be guarded against. The personnel for such combat groups usually comes from nearby combat groups. The reserves of higher units should not be used for this purpose.

Occasionally it is desirable to relocate some of the fixed infantry weapons at night.

The depth of the position should not be reduced by whatever changes are made at night.

CHAPTER V

A British Night Defense

(HISTORICAL EXERCISE)

During the Battle of Ypres (October-November, 1914), the Germans launched a night attack against the British on Messines ridge. The attack struck between the villages of Wytschaete and Messines (about three miles to the south).

Holding the sector in front of Wytschaete in positions just east of the town was the British Composite Household Cavalry Regiment. (See Figure 26). With a fighting strength of only 415 men, this regiment had organized its defense about as the map shows. By present standards this position had two grave faults. It not only lacked depth but there was little or no mutual support between units. And there was little coordination, also, with units on the regiment's right and left.

Let the reader assume that he has a single battalion of infantry at reduced strength available for the defense of the sector occupied by the Composite Household Cavalry Regiment; and that this battalion consists of three rifle companies and one machine-gun company. The rifle companies have three platoons of about 40 men each; the machine-gun company, two platoons of four guns each.

REQUIREMENT

Locations of company areas.
Locations of combat groups.
Locations of machine guns.
Changes made in dispositions at night.

(The adjacent unit on the north cannot place any machine-gun fire across the battalion front; but the unit on the south can support the defense by fire from one machine-gun section as indicated on Figure 26.)

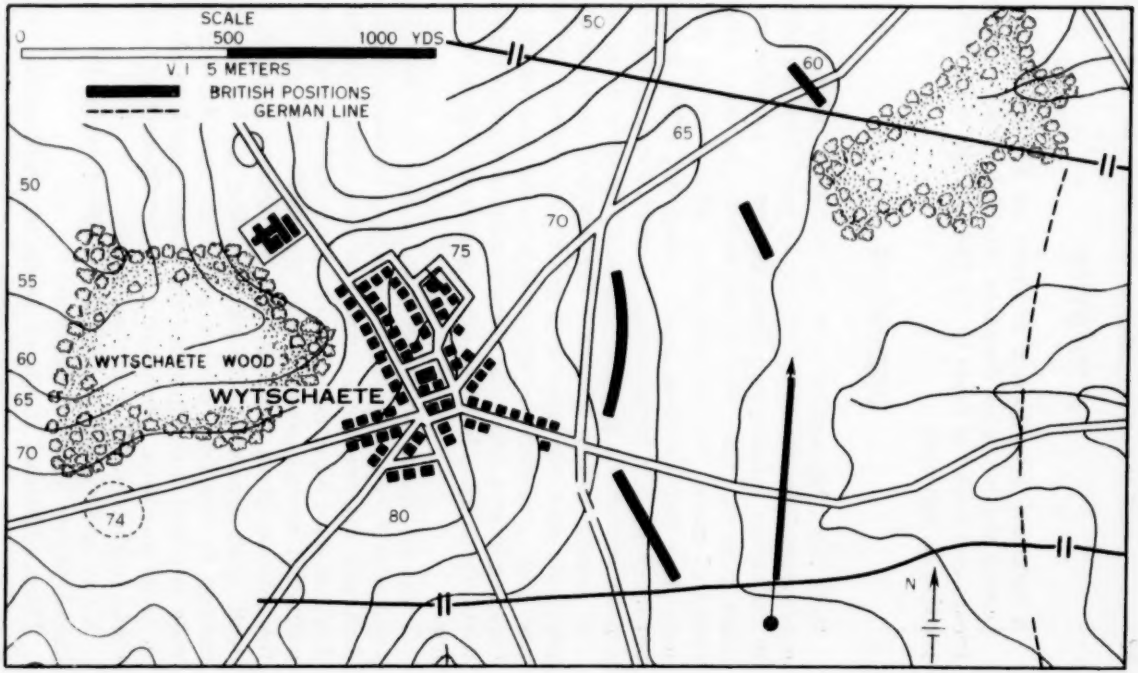

SCALE
0 500 1000 YDS
V I 5 METERS
BRITISH POSITIONS
GERMAN LINE
50
60
65
70
75
80
55
74
WYTSCHAETE WOOD
WYTSCHAETE
N

FIGURE 26.

A SOLUTION

A defensive organization is shown on Figure 27.

During the hours of darkness establish small security groups and listening posts to the front of the main battle position as indicated.

DISCUSSION

Once night has settled over the battlefield, visibility is cut to a small fraction of what it is by day. Men are wont to see enemy infantrymen behind every tree, hostile machine guns in every shadow, an ambush in every small clump of trees. On the other hand night, with its stillness, finds hearing more acute. Moreover, slight noises, unnoticed by day because their source is visible, become definite indications at night—especially to the trained ear—of specific human activity. The cautious tread of approaching men, the smothered grunt of an enemy soldier who steps unexpectedly into a depression, the swish of crawling in long grass, the singing snap of severed barbed wire—these and a hundred other sounds are full of meaning.

Thus, additional small security groups and listening posts sent forward at night dispel the phantoms of the dark and disclose the approach of the hostile attacker. Also, in some situations it may be advisable to establish additional combat groups within the battle position. But the solution given organizes the Wytschaete position in depth with intervals between front-line combat groups covered by fire from combat groups in rear, leaving no wide intervals through which the enemy might penetrate in large numbers. Therefore the establishment of additional combat groups is not necessary.

Active and vigilant patrolling should of course be continued during hours of darkness.

These additional measures taken at night should not alter, however, the main defense. The depth of the main

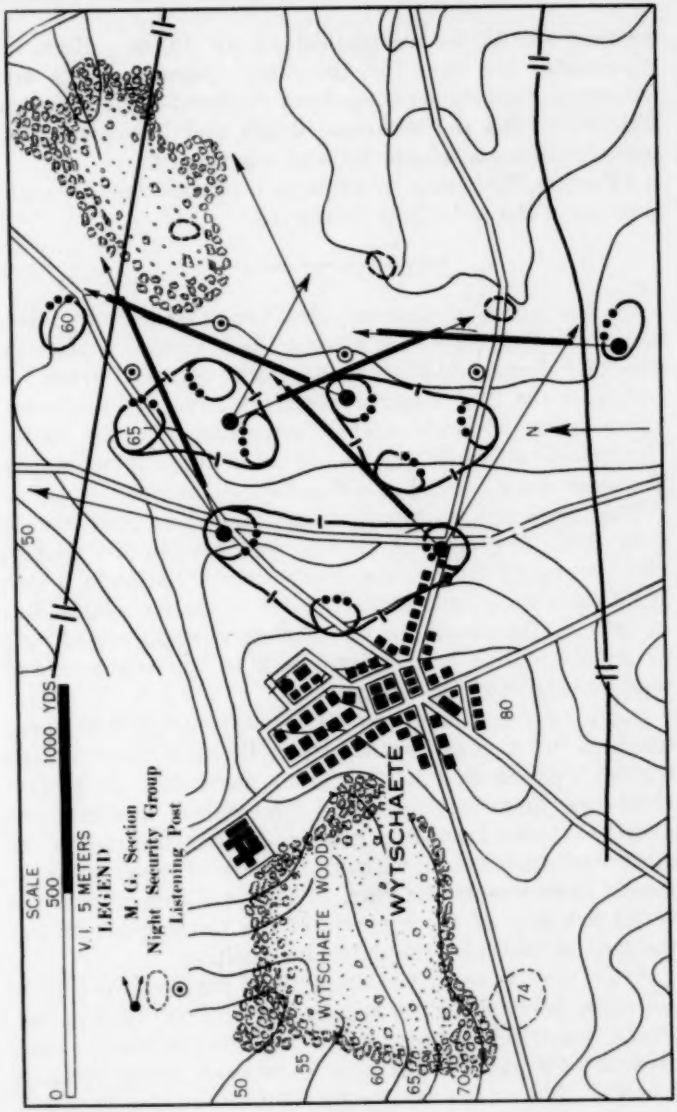

SCALE
0
500
1000 YDS
V. I. 5 METERS
LEGEND
M. G. Section
Night Security Group
Listening Post
WYTSCHAETE WOODS
WYTSCHAETE
N
50
55
60
65
70
74
80

FIGURE 27.

position should be maintained at all times. Here, at Wyschaete, the men for the night listening posts and security groups should come from the front-line companies. This maintains the defensive depth and leaves the battalion reserves available for any emergency.

(Further discussion of changes in dispositions at night is given in the preceding chapter.)

On the night of October 31st-November 1st, the Germans launched the attack against the Wytschaete position. The 17th Bavarian Reserve Regiment attacked from the east, and the 21st Reserve regiment from the southeast. These units had made careful preparations for the attack. The men wore white arm bands as distinguishing marks. Bayonets were fixed, but rifles kept unloaded.

The Germans advanced from assembly positions at 2:00 AM. They moved rapidly and maintained perfect direction by guiding on the windmill in Wytschaete, which stood out clearly against the skyline in the moonlight. But in spite of the moonlight, the British were surprised, and by 2:45 AM had been driven back to the northern and western edges of the village.

South of the village the Germans penetrated in large numbers to a considerable depth through gaps in the British line, leaving in their rear some men of British front-line units in position. And when daylight approached these front-line groups, finding themselves almost surrounded and without support of reserve units, fought their way to the rear. Their predicament was the result not only of the surprise of the German attack but the lack of depth of the defensive position.

After they were driven from their positions, the British made every effort to regain lost ground. A counter-attack was decided upon, and the brigade reserve was ordered to a position north of Wytschaete from which to effect it. But as the reserve moved into position it received fire not only from the Germans but from other British

troops who, in the darkness, mistook the reinforcements for the enemy. The confusion was so great that no counterattack was launched. Then, however, the British division commander took a hand in the affair, sending forward two battalions to counterattack at once. But the Germans by this time had strengthened their positions in the village; and this counterattack was first checked and then stopped by heavy German fire from the houses, and from a sunken road on the west side of the town.

The French 32d Division arrived opportunely about daylight, and by preponderant numbers forced the Germans to retire from Wytschaete.

CONCLUSION

During hours of darkness it is almost always necessary to modify daylight defensive dispositions to prevent surprise and penetration in large numbers between combat groups.

This is accomplished by—

(1) Alert and active patrolling.
(2) The establishment of additional and temporary combat groups.
(3) Increasing the density along the line of security.
(4) The relocation (in some cases) of infantry weapons.

The depth of the defensive position should be maintained, and remain unaffected by whatever changes are made at night.

CHAPTER VI

Tank Targets

When tanks move forward across the modern battlefield they are bound to find a large variety of hostile targets in any well-defended area. Machine-gun emplacements, combat groups, antitank guns, and other active agencies of the defense—any or all of these—tanks are likely to encounter as they approach the enemy's main battle position. And as they penetrate the defense still other targets may appear—mortars, artillery, command posts, and even such non-active elements as kitchens, motor parks, dumps, and other rear installations.

The choice of targets is so large, especially in the assault, that unless tank units have some general rule to go by, they are liable to waste their energies; for all targets that tanks might engage are by no means of equivalent importance. And there should be no turning aside to engage relatively unimportant targets so long as primary targets remain active in the tanks' zone of attack.

Active elements of the hostile defense are of two main kinds: targets dangerous to the attacking foot troops and those dangerous to the attacking tanks. But some of the enemy's weapons are equally dangerous to both, and since this is true, we can best classify possible tank targets, perhaps, in these three groups:

(1) Targets whose fires are effective against foot troops but not against tanks.

(2) Targets whose fires are especially effective against tanks but not particularly dangerous to foot troops.

(3) Targets whose fires may be effective against both.

To these three we need add but one more in order to include all elements of the hostile defense that tanks may fire upon, both during and after the assault:

(4) Targets offering no threat to either tanks or foot troops.

We can at present list in the first group (targets whose fires are effective against foot troops but not against tanks) machine guns and combat groups of riflemen and automatic riflemen. Present developments in the armor-penetrating power of small arms may soon result, however, in making the fire of some of these arms dangerous to tanks as well as troops.

Group 2 (targets especially effective against tanks but not particulary dangerous to foot troops) includes all antitank weapons, both antitank guns as such and artillery pieces used for antitank defense. It is to be expected that weapons designed or used especially for the destruction or disablement of tanks will generally not be used against other attacking elements except in emergencies.

Targets effective against either tanks or other infantry elements (group 3) are infantry mortars, supporting artillery, and hostile tanks. The fire of hostile supporting mortars or artillery can only disable a tank by a direct hit or a shell that falls very close. The modern tank, however, moves too fast to be much more than an accidental target for their fire. On the other hand, artillery (as distinguished from artillery guns used for antitank purposes) only becomes a target for tanks when the latter rapidly penetrate the hostile position to some depth. It is not improbable, however, that machine guns and combat groups with their rifles will, before long, also come under this head.

Under the classification of targets that offer no threat to either tanks or foot troops (group 4) are such elements as groups of the enemy not actively engaged in the defense

(pioneers, engineers, signal and supply personnel, etc.) and transport, both animal and motor.

Now, using as a basis the foregoing classification of tank targets, according to their degree of threat to our own tanks and foot troops, we can best determine the relative importance of these targets to tank units as they move forward in the attack.

In the first place, the mission of tanks is to help the foot troops forward. Hence it clearly follows that enemy targets which offer the greatest hindrance to the foot troops—hostile machine guns—are the most important. The machine gun, rather than the antitank gun, is the tank's principal target. The tank came into being because the machine gun made the attack of unprotected infantry so costly in lives that even victory was seldom worth the price. And up to the present at least, the machine gun is still the tank's logical reason for existence.

Tanks should turn from this main job to engage antitank guns only when the tanks' immediate safety requires it. When tanks receive hostile antitank fire at such range that the danger of disablement is great, they must give their whole attention to their own special enemy until it is defeated. But if tanks attempted to seek out and destroy every antitank gun that fired at them, they would have little time, or for that matter, ammunition, left for other targets. Ground combat would resolve itself into two simultaneous struggles: tank vs. antitank; and the remainder of the attacking troops against the remainder of the defenders. The tank fight would have almost as little direct effect on the contest as a fight between two planes far above the battlefield. Hence, except for duels of emergency, the tank must avoid the hostile antitank defense weapons rather than seek them out. For by so avoiding those fires tanks can be all the more help to the foot troops.

When neither machine guns nor immediately threatening antitank weapons require the attention of tanks, then assaulting tanks operate against other active elements of the hostile defense such as combat groups and infantry mortars. If no active elements of the hostile defense are found, tanks fire at any suitable targets such as transport or groups of troops.

But we must not overlook the fact that the importance of the enemy's antitank guns as targets for attacking tanks varies directly with their number and quality. As things stand today, it is probable that the number of such weapons possessed by the enemy in a possible war of the near future would be limited, although what weapons there were would have fairly adequate capabilities for their purpose. Two things are likely to impose this limitation: First, the heavily burdened infantry of today does not want to increase its overhead of armament any more than it has to. And, second, the guns simply will not be available in quantity when war comes. And a third factor which may enter in is indicated by the present belief, particularly in foreign armies, that the tank itself is the best antitank weapon.

This limitation might not continue to obtain, however, as the war progressed. The side thrown chiefly on the defensive (with especial reference to tanks) would soon be likely to produce antitank weapons in large numbers. And once this situation developed, the antitank gun would perforce become the initial target for the attacking tanks. But, the tanks should, as soon as the situation permits, revert to their primary mission—the silencing of hostile machine guns that may hold up friendly foot troops.

Again, if the rifle and machine-gun bullet catches up with and passes the armor of the tank, then every small arms weapon becomes an antitank gun and tanks can no longer function as effective instruments of warfare. The

fact that the modern tank may move with considerable speed will not save it from the tremendous amount of fire that would be placed upon it as soon as it appeared. The very quantity of this fire would also offset many times over the possibility that penetrable armor might give partial protection.

It is because modern warfare is subject to such rapid growth and change that we must consider briefly, at least, what form this growth and change is most likely to take before we can definitely say what will be the most important target for tanks in the attack. But we know that so long as the number of effective antitank weapons remains limited to few more than armies have today, such weapons are not, in general, tanks' primary target. The exception only comes, as we have seen, when a tank suddenly finds itself engaged by an antitank gun at such range that the danger of disablement is great. Here, it must turn its whole attention to its own enemy until one or the other is vanquished.

One more thought should be included in this discussion. Our attacking tanks may meet other tanks that are advancing in support of a hostile counterattack, or taking part in a delaying action. What should our tanks do then? Should they give battle or avoid it?

Whether hostile tanks should be engaged by our own depends entirely on what chance our tanks have of destroying the enemy. There are four possible situations:

(1) If the tanks of neither side had weapons that would harm tanks, they could blast away at each other, like the *Monitor* and the *Merrimac*, until the ammunition was expended, and nothing would be accomplished. Instead of engaging in any such sham battle, our tanks should proceed about their regular business, leaving the enemy's tanks to be dealt with by our antitank weapons. (The situation is nevertheless conceivable in which it would be worth while to attempt to block or hinder the movement

of hostile tanks by the maneuvering of our own. No technique of blocking or ramming has yet been developed, however.)

(2) Should our tanks have only machine guns, and those of the enemy have heavier weapons capable of penetrating our armor, we would have no course but to avoid getting within effective range. Such hostile tanks, in numbers equal to, or greater than, our own, might well prevent ours from accomplishing their mission or even drive them from the battlefield, unless our antitank elements prevented it. Against such odds, there would be nothing gained by the sacrifice of our tanks, when they could, by an orderly and expeditious retirement "live to fight another day" against less daunting odds.

(3) In the opposite case—our tanks equipped with guns effective against tanks, and the enemy's without them—we would naturally do the pursuing. Our tanks could hardly serve our foot troops better than by seizing every chance to destroy such hostile tanks. Once the enemy tanks were accounted for, our own should then return without delay to their original attack mission.

(4) But, if tanks meet, in a war of the immediate future, it is far more likely that the machines of each side would have weapons capable of destroying those of the other. It is to be expected that at least some of the tanks in each platoon of any army's tank units would have an armor-penetrating weapon, if not all of them. And when such tanks come together in a meeting engagement of their own, ours must ordinarily fight. The contest would undoubtedly take the form of a minor naval engagement except that there may be irregularities of terrain to consider. Our tanks must use their speed to reach favorable defiladed positions from which to fire and they must deliver their fire during frequent brief halts as in engaging antitank guns, rather than attempting to keep up a running battle.

What action our tanks should take in case they meet hostile tanks, should, of course, be covered in the attack

orders. In general, our tanks, if they have half a chance, should engage the others, especially if they form an element of a counterattack. For if the enemy's ground machine guns form the primary assault target during the first stages of an attack, certainly his mobile machine guns carried in tanks become still more important as soon as they become an element of the battle.

CHAPTER VII

The Defense of the Meuse River of Dinant August 14-15, 1914

(HISTORICAL MAP PROBLEM)

ORIENTATION

On August 12, 1914, the French armies were moving toward the frontiers. The I Corps on that day received orders from General Lanrezac, commander of the Fifth Army, to march to the north into southern Belgium with the mission of "preventing the enemy from crossing the Meuse River between Givet and Namur". (See Figure 28, General Map in pocket in back of book.) In order that the I Corps could begin at once to carry out its mission, the Fifth Army placed the 148th and 348th Regiments of Infantry, which were already in the area to be defended, under the orders of the I Corps.

The corps commander (General Franchet d'Esperey) planned to garrison the line of the Meuse with the minimum number of men, and hold the bulk of his force as a mobile reserve to counterattack the enemy should he effect a crossing. He ordered both the 148th and 348th to move to the Meuse at once "to guard against an enemy crossing". These regiments were also to provide the screen behind which the I Corps was to move into a central position a few miles west of the Meuse.

SITUATION

That part of the corps sector with which this problem deals is in Belgium and extends along the Meuse from Anseremme, inclusive, through Dinant to Bouvignes, inclusive. The force assigned to defend this sector is the 3d Battalion, 148th Infantry, which arrived on the west bank of the Meuse opposite Dinant on August 13.

Information of the enemy is vague, and is simply to the effect that the Germans have begun to invade Belgium and that German cavalry has appeared in the country east of the Meuse.

The Meuse River is 100 meters wide and unfordable.

The bridges have solid masonry side walls three feet high, on both sides, throughout their entire lengths. (See Figure 29, the large scale map in pocket in back of book.)*

REQUIREMENT

Assuming that the 3d Battalion, 148th Infantry is organized in accordance with our present tables of organization, and that it has a howitzer platoon attached, give the general plan of the Commanding Officer, 3d Battalion, 148th Infantry, for carrying out his mission of preventing the enemy from crossing the Meuse between Anseremme and Bouvignes, both inclusive.

DISCUSSION

There are in the sector assigned the 3d Battalion, 148th Infantry, only three crossings over the unfordable Meuse: the bridges at Anseremme, Dinant, and Bouvignes. No authority has been given to destroy these crossings. The high command probably expects to use them later.

---

*It should be noted that the contour interval of the map is 20 meters, about 66 feet.

Consequently, they must be left intact. The problem that confronts the battalion commander initially is, therefore. to prevent the Germans from crossing at these points. To do this he must also prevent the enemy from sending over a sufficient force by means of small boats or rafts, or by swimming, to defeat the defenders and clear one or more of the bridges.

There are two general plans open to the battalion commander:

(1) To defend initially with all or the bulk of his force east of the river, retiring to the west side when forced to do so.

(2) To defend initially with all or the bulk of his force west of the river, sending only patrols to the east. At Dinant and Bouvignes the east bank dominates the terrain to the west for some distance.* If the Germans are allowed to occupy the heights east of the river at these points, they have a good chance of smothering the defenders with fire and, under its cover, working a sufficient force across the bridges to drive back the defenders and open the way. However, if this should happen, the 3d Battalion, 148th Infantry, can still delay the advance of the Germans, and so screen the corps reserve.

On the other hand, the terrain east of the river at Dinant and Bouvignes does not lend itself to a strong defense, especially by such a small force, and there is also the danger that part or all of the force may be cut off before it can get back across the river. Furthermore, at Anseremme the terrain on the north bank dominates that on the south bank, and so naturally promises a strong defense by a relatively small part of the force.

---

*The dominating heights east of the Meuse can be more clearly visualized after studying the picture (Figure 30) opposite page 114.

Taking all of these factors into consideration, the battalion apparently has a better chance of accomplishing its mission by defending with the bulk of its force initialily on the west side of the river, and sending only patrols to the east.

The terrain and the road net favor a German initial attempt to force the crossing at Dinant. Therefore, the bulk of the battalion should be employed to prevent seizure of the Dinant bridge, and the remainder to prevent seizure of the Anseremme and Bouvignes bridges.

A SOLUTION*

The commanding officer of the 3d Battalion, 148th Infantry, decides—

To defend the crossings of the Meuse from positions west of the river.

To send one rifle platoon, with a platoon of machine guns attached, to Anseremme to defend the subsector: Anseremme—road junction on the west bank a mile and a half southeast of the Dinant bridge (both inclusive).

To send one rifle company (less one platoon), with a section of machine guns attached, to Bouvignes to defend

*This is not the historical solution. The historical solution is given later.

the subsector: railroad crossing seven-eighths of a mile southeast of the Bouvignes bridge, exclusive, to Bouvignes, inclusive.

To hold one rifle company (less one platoon) and one section of machine guns as sector reserve.

To defend the Dinant subsector (center) with the remainder of the battalion (one rifle company, one rifle platoon, one machine-gun platoon, howitzer platoon, and headquarters company).

REQUIREMENT

a. The detailed plan of the commanding officer, 3d Battalion, 148th Infantry, for the defense of the Dinant subsector, from the road junction one mile and a half southeast of the Dinant bridge, exclusive, to the railroad crossing seven-eighths of a mile southeast of the Bouvignes bridge, inclusive, to include only the following:

(1) Security measures during daylight.

(2) Initial positions of rifle companies, machine-gun sections and howitzer platoon weapons, in general.

(3) Obstacles.

(4) Restrictions, if any, on noncombatants crossing the river.

(5) Wire communications established by the battalion.

(6) Location of the battalion command post.

b. Location and dispositions of the sector reserve.

A SOLUTION*

a. (1) To send motor patrols to the line Conneux-Ciney (General Map) to secure early information of a hostile advance.

To send small observation patrols, with intelligence personnel attached, across the Meuse to positions from which they can observe the roads leading to Dinant. Possible locations for observation patrols are the Tower and the Old Fort; other suitable locations can be found farther east. The important point is to establish observation east of the river in order that work on the position can be stopped and the defenses occupied prior to the arrival of the enemy on the east bank.

To patrol the west bank of the river to prevent the crossing of small bodies of the enemy.

To have one or more observation posts on the high ground west of Dinant covering the subsector.

To have the commanders concerned post observation groups near all working parties west of the river.

(2) One rifle company to prevent a crossing between the southernmost house on the west bank at Dinant and the north boundary of the Dinant subsector. One rifle platoon to prevent a crossing in the remainder of the Dinant subsector.

To place one section of machine guns directly west of the bridge in position to sweep the bridge.

To place one machine gun in a house north of, and one in a house south of, the bridge in order to cover its eastern entrance and as much of the eastern bank as observation from their positions will permit.

To place the 37-mm gun on the nose southwest of the bridge to cover the Old Fort and probable German machine-gun positions in that vicinity.

To place the mortar seven-eighths of a mile southeast of RJ 208 to cover the terrain just east of the bridge

*Not the historical solution.

and the terrain adjacent thereto within the range of the mortar.

(3) To prepare wire barricades throughout the length of the bridge which can be swung into position quickly. Also, to place such obstacles in front of prepared positions as time and the facilities available permit.

(4) To close the bridge immediately and prohibit all crossing of the river by civilians. To collect all boats and hold them on the west bank.

(5) To install a telephone line from the command post of the battalion to the headquarters of each of the three subsectors, and also a line to the battalion observation post. Additional wire will have to be obtained locally to supplement what the battalion has.

(6) To place the command post under cover between Roche au Conin and RJ 208.

b. The sector reserve is to prepare hasty intrenchments generally along the 200-meter contour about three-quarters of a mile west of Dinant to cover the terrain to the southeast, east and northeast. Upon completion of this work the rifle company of the reserve is to take post in the vicinity of RJ 208. The machine-gun section of the reserve is to go into position at once on the hillside three-quarters of a mile west of the Dinant bridge and be prepared to fire on the east bank. It will also be prepared to move to other parts of the sector upon orders of the battalion commander.

(This, of course, is only *one* solution. The exact dispositions of the rifle units and the supporting weapons would depend largely on the ground, and on such natural concealment as grass, brush or growing crops.)

HISTORICAL SITUATION

The French infantry battalion of 1914 had four rifle companies of 250 men each. Rifle companies had four platoons. The battalion also had a section of two machine guns.

The corps commander left his headquarters early in the morning of August 14 to inspect his advance units on the Meuse. Upon arriving he found the 3d Battalion, 148th Infantry not organized for the defense. The bridge at Dinant was not barricaded and people were crossing the river without interference except by two unarmed Belgian civilian guards who were examining credentials. The battalion planned merely to take cover behind the walls in the immediate vicinity of the west end of the bridge.

The general gave emphatic orders to remedy this condition. He posted one company at Bouvignes and another at Anseremme to cover the bridges at these two points. The remainder of the battalion was ordered to remain at the Dinant crossing, with two platoons posted on the heights across the Meuse near the Old Fort.

Information of the enemy

12:00 M.—Information was received from corps that an enemy column of infantry and cavalry had been reported in Conneux, six miles east of Dinant, probably marching on Dinant.

1:00 PM.—Corps advised that enemy forces of all arms, cavalry in the majoirty, had reached the line Achene-Custinne, six miles east of Dinant.

5:00 PM.—Inhabitants reported that 5,000 Germans were at Dorinne, five miles northeast of Dinant, and that a German squadron was in the Froide Veau ravine southeast of Dinant.

6:20 PM.—Reliable information was received that Sorinne was now occupied by two German cavalry regiments, probably the 1st and 5th Hussars.

6:35 PM.—The 3d Battalion, 148th Infantry, received reliable information that Anseremme was being attacked by German artillery and that Dinant was threatened with immediate attack.

When this information reaches corps headquarters it causes the issuance of orders that send the leading regiment of one of the columns of the I Corps forward to reinforce the 3d Battalion, 148th Infantry, at Dinant. It is

the 33d Infantry that is ordered to send a battalion to the Anseremme crossing, a battalion to a position in reserve at Roche au Conin, and the remainder of the regiment to the crossing at Dinant.

It is August 15. Lieutenant Colonel Stirn, commander of the 33d Infantry, arrives at the bridge at Dinant at daylight, and assumes the command of the Anseremme-Dinant-Bouvignes sector. The units now at the Dinant crossing are his own 3d Battalion, 33d Infantry (recently arrived and now halted on the west bank of the river near the bridge), and a machine-gun section and two rifle companies of the 3d Battalion, 148th Infantry, two platoons of which are posted on the heights east of the river near the old fort.

Lieutenant Colonel Stirn, having acquainted himself with the situation, is convinced that the enemy may attack at any time. He is confronted with a decision. Shall he superimpose his own 3d Battalion, 33d Infantry upon the units of the 3d Battalion, 148th Infantry, at Dinant and Bouvignes, or shall he reorganize the Dinant-Bouvignes sector?

REQUIREMENT

Which of these alternatives should Lieutenant Colonel Stirn adopt? Why?

HISTORICAL SOLUTION

Lieutenant Colonel Stirn decides to superimpose the 3d Battalion, 33d Infantry, on the units of the 3d Battalion, 148th Infantry, at Dinant and Bouvignes.

An attack in force is imminent. It is now daylight. The sector is wide. To effect a complete reorganization would take hours, and would probably have to be made under heavy German fire.

HISTORICAL SITUATION

Lieutenant Colonel Stirn turns to the Commanding Officer, 3d Battalion, 33d Infantry, and says, "Take one of your companies across to the right bank of the river, drive off the enemy, and hold the crests which dominate the city." He also directs Commanding Officer, 3d Battalion, to send one of his companies to Bouvignes to reinforce the company of the 148th Infantry at that point. The remaining units of the 3d Battalion, 33d Infantry, are placed with the units of the 3d Battalion, 148th Infantry, which have gone into position along the west bank of the Meuse. These units use what cover is available—for the most part retaining walls along the river bank and the houses that border both sides of the highway along the west bank of the Meuse.

It is 5:00 AM. Major 3d Battalion 33d Infantry, fol-

lowed by one of his companies, the 12th, crosses the bridge and ascends the steep slope to the Old Fort. The bulk of the company takes the direct road up the steep slope from the city to the fort, while one platoon of the 12th Company moves via RJ 97 to approach the fort from the north. When it gets 500 yards west of RJ 97, the platoon surprises and drives off an enemy patrol. The platoon then continues on its way to the fort and reports the occurrence to the company commander, who informs the battalion commander.

Major 3d Battalion 33d Infantry finds the two platoons of the 148th Infantry at the Old Fort. These men of the 148th Infantry are fatigued from an anxious night in an isolated and exposed position. From the two officers of the 148th Infantry the major receives information that corroborates previous reports that the enemy is close at hand and likely to attack at any time. But at the present moment, 5:15 AM, all is quiet.

REQUIREMENT

The dispositions that Major 3d Battalion 33d Infantry makes of the rifle company, 33d Infantry, and two rifle platoons, 148th Infantry, under his command on the heights east of the Meuse.

(In the solution of this requirement it should be assumed that the rifle company and two additional platoons have our present-day organization.)

A SOLUTION*

The mission of the detachment is to "hold the heights that dominate the city". The most prominent feature on these heights is the Old Fort. Southeast from the fort for a distance of several hundred meters the ground appears from a map study to be precipitous and to command Dinant, east and west of the river. The gentler wooded slopes north of RJ 97 offer excellent cover for a hostile force to approach that part of Dinant near RJ 97, but because of the woods, there are no positions on these slopes from which to fire upon the west bank of the river. The battalion commander is more likely to accomplish his mission if he holds only from the Tower to the Old Fort, both inclusive.

The farther east of this line the small force goes, the greater is its risk of being cut off and failing to accomplish anything.

The Tower and the Old Fort should permit observation well to the southeast, east, and northeast, and so reduce the amount of patrolling during daylight.

The following initial dispositions seem to meet the situation as it was known to the detachment commander:

Two platoons to hold from the Tower, inclusive, to the Old Fort, exclusive.

Two platoons around the Old Fort to hold it.

The remaining platoon in reserve initially 300 yards southeast of the Old Fort.

The exact dispositions of the platoons would, of course, have to be determined on the ground.

HISTORICAL SOLUTION

Major 3d Battalion 33d Infantry disposed his forces as follows:

12th Company, 33d Infantry: One platoon at the stone

*Not the historical solution.

quarry (one and one-quarter miles east of the Old Fort; one platoon in front of the Old Fort; two platoons astride the road (Dinant-Ciney) a short distance from the Old Fort.

Two platoons 148th Infantry in position in and about the Old Fort.

At *6:00 AM* the horse batteries of the Germans opened fire on the Old Fort, which was a veritable shell trap. The Germans, after driving in the platoon at the quarry, launched an infantry attack against the defenders in front of the Old Fort. The enemy worked forward under cover of the trees, hedges, and thickets which dotted the terrain to its front.

At *6:30 AM* Major 3d Battalion 33d Infantry, sensing the hopelessness of his situation, sent a message to his regimental commander on the west bank of the Meuse asking whether it would not be better to evacuate a position so difficult to defend. He received this reply: "Hold on as long as possible with the aid of the 10th Company which I am sending you, and the support of the artillery fire which I have requested."

The 10th Company soon arrived.

9:00 AM.—The enemy's fire increased and his advance became more rapid.

10:00 AM.—The enemy advanced to within 50 yards of the line held by the 12th Company. The 12th Company was driven back to the Old Fort.

10:45 AM.—The enemy reached the outer walls of the Old Fort and attempted to scale the walls. Enemy machine guns fired on the Old Fort from the Tower. An enemy machine gun worked forward into a position from which it could cover the steep slope from the Old Fort to the bridge. A platoon of the 10th Company attempted to counterattack and silence this gun but the attempt failed.

When the promised artillery support did not materialize, Major 3d Battalion 33d Infantry decided to make

a dash for the bridge and escape with what men of his two and a half companies he could bring out. He organized for the attempt, with the 10th Company in the lead, and the 12th in rear to cover the movement. His buglers sounded the charge as if to counterattack, and with a cry of "Vive la France!" the French dashed down the slope and crossed the bridge. The bulk of the command made good the escape.

HISTORICAL CONCLUSION

With the evacuation of the heights on the east bank by the French, the Germans advanced and occupied the crest overlooking Dinant. From their position on the heights the Germans poured a heavy rifle and machine-gun fire on the French on the west bank. German artillery also came up. It opened fire on the line of houses on the west bank and the French were soon forced to move back from the river to the hills, out of small arms range.

Later in the day, General d'Esperey, commanding the French I Corps, ordered up the remainder of the 2d Division to which the 33d Infantry belonged. He also sent forward a part of his corps artillery. Two fresh regiments of the 2d Division, supported by the assembled artillery, attacked Dinant from the heights west of the Meuse and drove the Germans back across the river. The effective support of the French artillery soon enabled the 2d Division to force its way across the bridge, and retake Dinant and the heights to the east of the city. The German retirement was so sudden that the wounded of the 3d Battalion, 33d Infantry, who had been left behind in the fort, were recovered in the casemate where the French had left them.

The attack of the Germans against the Bouvignes-Dinant line was made by five battalions of Jagers (light infantry) that were supporting the two German cavalry divisions in front of Dinant.

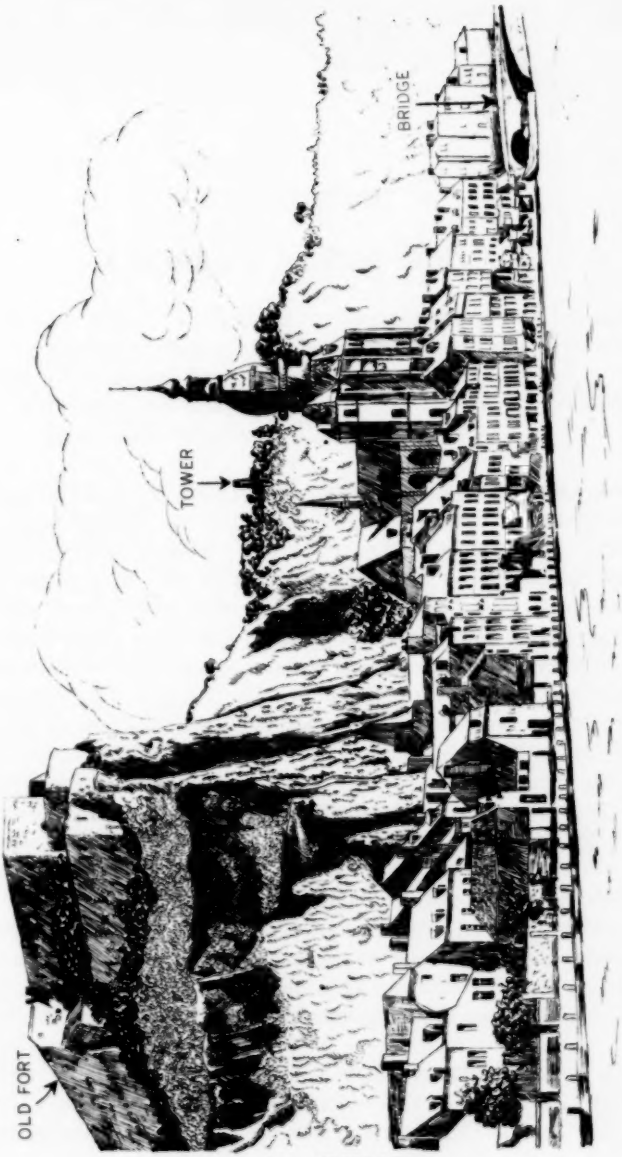


FIGURE 30.—DINANT.

CHAPTER VIII

Chemicals in Riot Duty*

"A man can no more quell a riot because he has learned the principles of fire control than he can lay out a trench because he knows how to weed a garden."

—Treatise on Riot Duty—Colonel Henry A. Bellows, Minnesota National Guard.

The attitude of many army officers, both Regular and National Guard, is that riot duty is a most unpleasant task,—undeserving of much thought or training. But the support of the civil authorities in safeguarding the public peace when it is threatened by enemies within our country is as much a function of all military units as to protect the country from enemies without. Therefore it behooves all officers to be constantly prepared to perform promptly and efficiently any duty in connection with control of civil disturbances, particularly since the call to such duty is always imminent. They should know what their duties and responsibilities in this regard are, and should make a thorough study of the subject in all its phases.

This chapter deals with merely one phase of riot duty —the control of civil disturbances by the use of non-lethal chemicals. A knowledge of such a use of chemicals is of extremely practical value; for by this means most disturbances can be controlled and mobs dispersed

*Based upon "Instructions for the control of civil disturbances by non-lethal chemicals"—The Chemical Warfare School, Edgewood Arsenal, Maryland, 1934.

with a minimum of force, and without the aftermath of permanent casualties or even deaths necessarily following the use of fire arms. The effects of different chemicals vary widely from the harmless psychological effects of screening smokes to the immediate death of toxic gases in high concentration. We can, therefore, select from among them the one we consider necessary to accomplish the end desired and nothing more. This is not true of bullets, for a bullet once on its way is likely to kill or seriously injure whomever it strikes.

CHEMICAL AGENTS SUITABLE FOR USE IN MOB CONTROL

In order to intelligently select the proper chemical to use in a given situation it is first necessary to learn the effects of those available. The following indicates the principal effect of the chemicals found useful in mob control:

CN, generally referred to as tear gas, causes lacrimation, with the effect of temporary blindness from excessive watering of the eyes.

DM, an irritant smoke, causes sneezing, violent headache, and vomiting. A person affected by DM appears to the uninitiated to be in the throes of death, but the effect is temporary only and leaves no permanent injury.

CN-DM mixture is, as the common name implies, a combination of CN and DM and therefore has the effect of both chemicals but is not as powerful as DM alone. It causes lacrimation, sneezing, and some vomiting.

These three chemicals are classified as harassing agents because of their physiological effect.

HC smoke is a screening agent only, forming a heavy smoke cloud which can be used to cover a mob or to conceal military operations. It has no physiological effect.

Table I gives considerable data pertaining to these four harassing and screening agents. These chemicals, even in the heaviest concentration possible in the field,

TABLE I

CHEMICALS SUITABLE FOR USE IN MOB CONTROL

PROPERTIES	*HARASSING AGENTS*			*SCREENING AGENT*
Common Name	*Tear Gas*	*CN-DM Mixture*	*DM*	*HC Mixture*
C. W. S. Symbol	*CN*	*CN-DM*	*DM*	*HC*
Composition	Chloracetopenone Smokeless Powder Magnesium Oxide	Chloracetopenone Diphenylamine-chlorarsine Smokeless Powder	Diphenylamine-chlorarsine Smokeless Powder Magnesium Oxide	Hexachlorethane Zinc Oxide Zinc Powder
Odor in Air	Like locust blossoms	Biting, irritating	No characteristic odor	Like camphor, smoky odor
Persistency (in open)	10 minutes	10 minutes	10 minutes	10 minutes
Minimum effective protection	Tight-fitting goggles	Best commercial mask	Best army mask	None needed
Physiological action	Lacrimation, skin itching	Sneezing, lacrimation, vomiting	Sneezing, voilent headache, vomiting	None
First aid treatment	Wash eyes with boric acid solution, keep eyes open Face clear wind	Wash eyes with boric acid solution. Same as DM	Breathe chlorine in low concentration	None needed
Distinctive munition marking	1 green band CN GAS	1 green band CN-DM GAS	1 green band DM-GAS	1 yellow band HC-SMOCKE
Munitions in which filled	Hand and rifle grenades	Hand grenades	Candles	Candles and hand grenades

do not cause death or even seriously endanger health, but are frequently more effective than fire arms.

The above table contains considerable information of practical value. Thus, opposite "Munition in which filled" it is seen that the tear gas CN is placed in grenades, both hand and rifle, and DM in candles only. Again, the "Odor in Air" of tear gas (CN) is like locust blossom, whereas DM has no characteristic odor. The physiological action of the CN-DM mixture causes sneezing, lacrimation, and vomiting. HC mixture (a screening smoke only) has no physiological effect. Distinctive markings on munitions containing chemicals are also indicated. Thus the distinctive markings of any munition containing tear gas (CN) are one green band and the symbol CN GAS painted on the munition.

MUNITIONS SUITABLE FOR USE IN MOB CONTROL

The chemicals described in Table I are filled in five types of projectiles or munitions that are suitable for use in mob control. These munitions, with distinctive markings indicated, are:

Grenade, hand, tear, CN, M-7 (Figure 31): Marking, 1 green band—CN GAS.

Grenade, hand, irritant, CN-DM, M-6 (Figure 32): Marking, 1 green band—CN-DM GAS.

Grenade, rifle, tear, CN, Mark II (Figure 33): Marking, 1 green band—CN GAS.

Candle, irritant, DM, M-1 (Figure 34): Marking, 1 green band—DM GAS.

Grenade, hand, smoke, HC, M-8 (Figure 35): Marking, 1 yellow band—HC SMOKE.

All of the grenades are issued by the Ordnance Department, but the DM candle is supplied by the Chemical Warfare Service only, and then only under certain restrictions. This candle must be used under the supervision of an officer of the Chemical Warfare Service or a staff officer designated for that purpose.

In their order of effectiveness or severity of action, beginning with the least severe, these munitions can be listed as follows:

Hand grenades containing HC smoke.
Hand and rifle grenades containg tear gas CN.
Hand grenade containing CN-DM mixture.
Candle containing DM, irritant.

Table II on page 124 gives approximate data concerning these five mob control munitions*

*Technical Regulations 1350-B, 1350-C, and 1120-5 describe these munitions in detail.

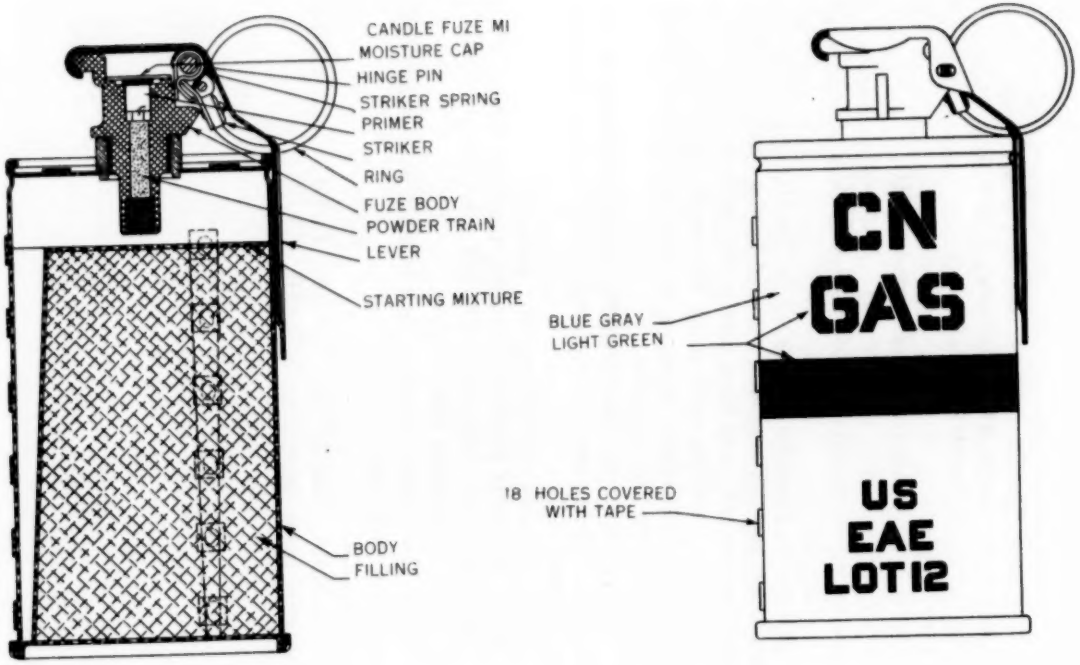


FIGURE 31.—Grenade, hand, tear, CN, M-7.

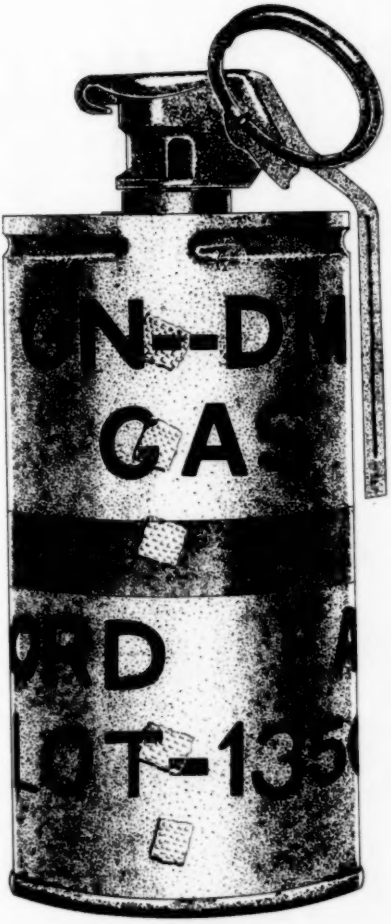


FIGURE 32.—Grenade, hand, irritant, CN-DM, M-6.

TABLE II

DATA ON MOB CONTROL MUNITIONS

Munition	*Grenade, Rifle, Tear, CN, Mk II*	*Grenade, Hand, Irritant, CN-DM, M-6*	*Grenade, Hand Tear, CN, M-7*	*Candle, Irritant, DM, M-1*	*Grenade, Hand Smoke, HC, M-8*
Filling	CN burning Mixture	CN-DM burning mixture	CN burning mixture	DM-Smokeless powder	HC burning mixture
Weight 1 round	23 ounces	20 ounces	16 ounces	9 pounds	32 ounces
Time of burning	30 seconds	1 minute	1 minute	2 minutes	3 minutes
Persistency in open	10 minutes	10 minutes	10 minutes	10 minutes	10 minutes
Persistency in halls	30 minutes	1 hour	1 hour	30 minutes	30 minutes
Persistency in closed rooms	3 hours	6 hours	6 hours	Until cleaned up	30 minutes
Danger from flying particles	None except fall of grenade	None	None	None	None
Effective range of cloud from 1 round	50 yards	75 yards	200 yards	500 yards	100 yards

Munition	*Grenade, Rifle, Tear, CN, Mk II*	*Grenade, Hand Irritant, CN-DM, M-6*	*Grenade, Hand Tear, CN, M-7*	*Candle, Irritant, DM, M-1*	*Grenade, Hand, Smoke, HC, M-8*
Special precautions in using	Danger from landing grenade	Persons exposed may suffer slight effect of DM	Fast burning grenade. Can not handle after it functions	Candle must be set upright. Persons unprotected liable to severe irritation effect	Useful for screening smoke protection only
Issued by	Ordnance Dept.	Ordnance Dept.	Ordnance Dept.	C. W. S.	Ordnance Dept.

NOTE.—A two-compartment grenade, built on the principle of the DM candle, has been found to be more effective than the CN-DM grenade, M-6. This new grenade, when issued, should be used like the CN-DM grenade, M-6.

Special precaution.—The above are burning type munitions. If any one of these is fired in close proximity to easily combustible material, fires are liable to result. Special precautions to prevent fires must, therefore, be taken in using the above munitions.

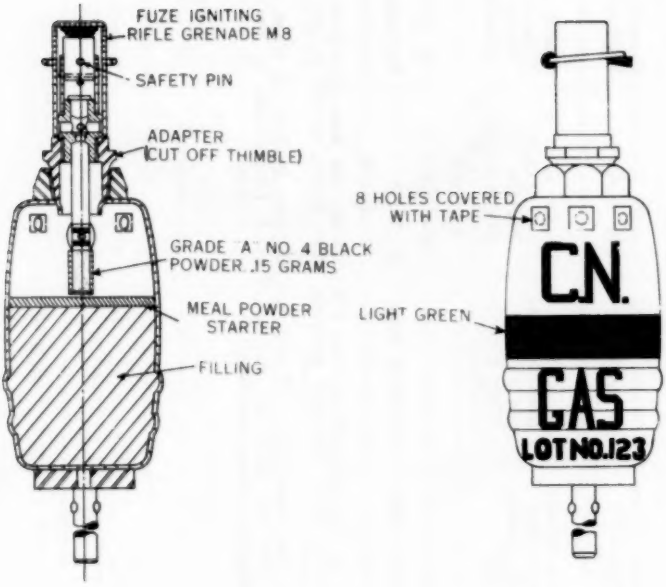
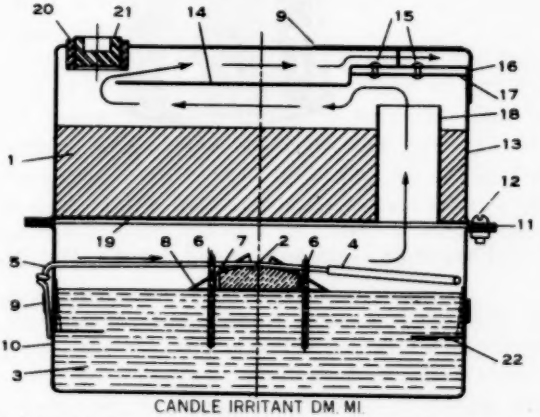


FIGURE 33.—Grenade, rifle, tear, CN, Mark II.



CANDLE IRRITANT DM, MI

1 IRRITANT SMOKE MIXTURE
2 MATCH HEAD
3 SMOKELESS POWDER FUEL
4 SCRATCHER
5 PULL WIRE
6 MATCH HEAD ANCHOR
7 MATCH HEAD RING
8 MATCH HEAD PLATE
9 ADHESIVE TAPE
10 FUEL CONTAINER
11 GASKET
12 STOVE BOLT
13 UPPER CONTAINER
14 BAFFLE PLATE
15 ROUND-HEAD IRON RIVET
16 INSULATOR
17 INSULATOR PLATE
18 VENT PIPE
19 UPPER CONTAINER BOTTOM
20 BUSHING
21 FILLING PLUG
22 RETAINER

FIGURE 34.—Candle, irritant, DM, M-1.

FIGURE 35.—Grenade, hand, smoke, HC, M-8.

GAS AND SMOKE CLOUDS

When a quantity of a chemical is released as vapor or smoke into the air, convection currents and diffusion tend to carry the cloud upward, while diffusion and shifting winds cause the cloud to spread laterally. Wind currents near the ground give the cloud a rolling motion, since the wind velocity one foot from the ground is not more than half that at six or eight feet above the ground. Therefore, as a chemical cloud moves downwind it lengthens out and spreads laterally. This is true whether the cloud is a visible smoke or an invisible vapor.

In bright sunlight, a smoke cloud may increase in height from one-fifth to one-half the distance travelled. But on a dull, cloudy day, it rarely increases in height more than one-tenth the distance travelled. At night the increase in height of the smoke is negligible after the first 500 yards. A high wind tends to reduce the height of the cloud while low winds allow the maximum increase in the cloud elevation.

Steady winds cause little lateral spread of the gas or smoke cloud whereas shifting winds cause a rapid dispersion of the cloud. In a steady four- to eight-mile breeze, which is a favorable condition for gas cloud travel, the increase in cloud front may be safely taken as 15 per cent of the distance travelled. Under average conditions the spread and the increase in length are at least 20 per cent of the distance travelled, and are frequently much greater.

As stated before these same general rules for cloud travel apply whether the chemical cloud is an invisible vapor or a visible smoke. The cloud released from CN tear gas grenades, both hand and rifle, is visible at the point of origin only, and then rolls downwind in the

form of an invisible vapor. On the other hand the cloud generated by DM candles is a heavy canary yellow smoke, and the path and form of the cloud are therefore clearly visible. The chemicals released from the hand grenade containing CN-DM mixture form a cloud that is also visible but is not as heavy a smoke as that from DM candles. The cloud from HC hand grenades is a white, thick smoke and therefore its path and the area it covers are easily observed.

Table III illustrates the foregoing rules of gas and smoke cloud travel and the necessary quantities of ammunition required under various conditions.

To illustrate the use of Table III, we will assume that it has been decided to use tear gas (CN) against a mob that is about 250 yards downwind from us and is covering a front of approximately 75 yards. In practice, the cloud generated should be about twice as wide when it reaches the target as the front of the target itself. (See Figure 36.) This allows a factor of safety for any error in determining the direction of the wind or in selecting the line on which to release the chemicals. In this situation, therefore, we want the tear gas cloud to be about 150 yards wide when it has travelled 250 yards downwind and reached the mob. We determine from Table III, then, that we should release about 15 tear gas hand grenades on a front of about 100 yards. The gas cloud generated will drift downwind; and when it reaches the mob it will be about 40 yards high and about 150 yards in width. This cloud will be effective for two minutes only and the "shoot" should be repeated every two minutes as long as effect is desired.

In this connection there is a possibility of misinterpretating certain statements relative to distances made in both Table II and Table III. For example, in these tables, effects produced by a stated number of rounds of grenades and candles are given for distances of 200 yards and over. These figures should be taken to mean

TABLE III

QUANTITIES OF MUNITIONS REQUIRED TO PRODUCE EFFECTIVE CONCENTRATIONS

Average field conditions — *Wind perpendicular to firing front*

Width of initial cloud front. All munitions fired simultaneously and evenly distributed on the front. (Width of firing line.)	250 yards downwind				500 yards downwind				1000 yards downwind			
	Number of munitions required	*Height of cloud*	*Width of cloud*	*Length of time action lasts at target*	*Number of munitions required*	*Height of cloud*	*Width of cloud*	*Length of time action lasts at target*	*Number of munitions required*	*Height of cloud*	*Width of cloud*	*Length of time action lasts at target*
	GRENADES, HAND, TEAR, CN, M-7 AND GRENADES, HAND, CN-DM, M6 (Fire this number of grenades every 2 minutes that the effect is desired)											
Point	4	50 yd	50 yd	2 min	25	100 yd	100 yd	3 min				
25 yards	6	40 yd	75 yd	2 min	25	80 yd	125 yd	3 min	50	160 yd	225 yd	4 min
100 yards	15	40 yd	150 yd	2 min	40	80 yd	200 yd	3 min	70	160 yd	300 yd	4 min
250 yards	25	40 yd	300 yd	2 min	70	80 yd	350 yd	3 min	100	160 yd	450 yd	4 min
	CANDLES, IRRITANT, DM, M-1 (One shoot will usually be sufficient)											
Point	1	40 yd	50 yd	3 min	5	100 yd	100 yd	3 min				
25 yards	2	40 yd	75 yd	3 min	5	80 yd	125 yd	3 min	25	160 yd	225 yd	4 min
100 yards	4	40 yd	150 yd	3 min	10	80 yd	200 yd	3 min	35	160 yd	300 yd	4 min
250 yards	8	40 yd	300 yd	3 min	25	80 yd	350 yd	3 min	50	160 yd	450 yd	4 min

NOTE 1. For screening smoke effect use same number of HC Grenades as CN Grenades under like conditions.
NOTE 2. In war or against desperate mobs use two to five times the above number of munitions.
NOTE 3. Under favorable conditions; i.e., with steady winds, at night or in cloudy weather, one-half the munitions shown in this table will be sufficient.
NOTE 4. For distances of 100 yards downwind or less, place all munitions 10 yards apart on firing line. Make firing line twice as wide as target to be covered.
NOTE 5. For use indoors, fire 1 grenade, M-6 or M-7 for each 5,000 cubic feet of air space in the room.
NOTE 6. In using rifle grenades, tear, CN, use about three times the number of hand grenades, tear, CN, indicated.

the extreme limits of effectiveness of the munitions, and not the proper distances from the mob at which the munitions should be ignited or discharged. Troops should

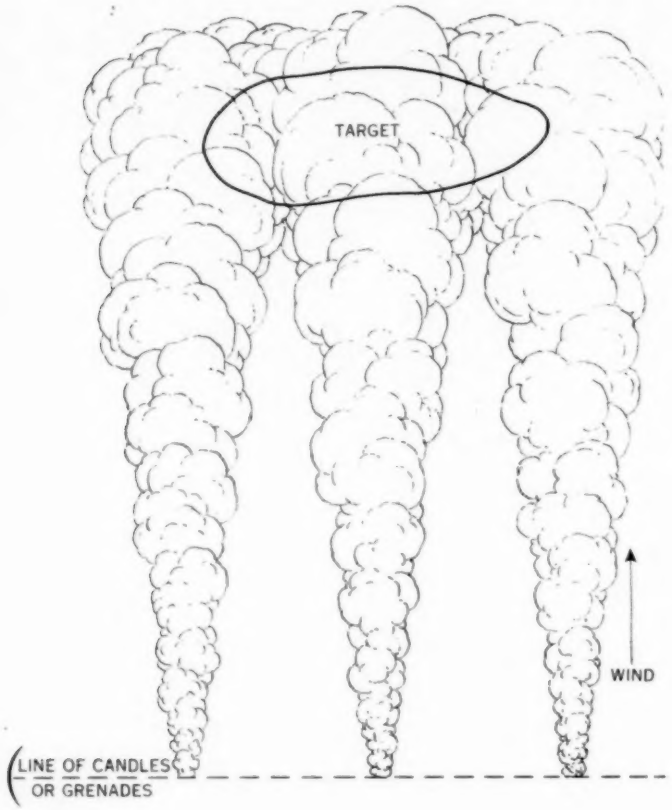


FIGURE 36.

approach as close as possible to a mob before using their chemical munitions, without unduly exposing themselves to missiles or other weapons possessed by the mob.

PROTECTIVE DEVICES LIKELY TO BE USED BY A MOB

As the employment of chemicals becomes more generally understood, mobs or individuals will very likely attempt to protect themselves against these chemicals. Improvised devices for such protection are likely to be encountered.

A thin silk handkerchief over the face offers some protection from tear gas. An ordinary pair of goggles offers more protection. And a good pair of close-fitting goggles, combined with a cellulose pad over the nose, or a snout type commercial mask, gives still more protection. The following list, beginning with the least effective, indicates the approximate order of protection against irritant chemicals:

Silk handkerchief over the face.
Snug-fitting goggles.
Goggles with cellulose pad over nose.
War time army gas mask.
Best commercial mask.
Army training mask.
Service type gas mask.

The protection likely to be used by a mob should be carefully considered before the weapon to be used against it is chosen. The DM from the M-1 candle will penetrate any emergency or commercial protection now available. The irritant smoke from the CN-DM grenade will penetrate any protection except the service gas mask and the best commercial gas masks. From the weapons available, one or more best adapted to the situation should be selected. As stated before, weapons available to Regular Army and National Guard organizations are HC smoke and CN-DM hand grenades, rifle and hand CN (tear gas) grenades. The DM candle is also available when specially ordered by proper authority.

TACTICS OF THE USE OF CHEMICALS AGAINST MOBS

Hesitation in the face of a mob is always dangerous. Sometimes it is even fatal. For this reason if for no other, a careful estimate of the chemical situation, made well before the time for action, is absolutely essential. A definite line of action should be determined beforehand, which can immediately be executed should the use of chemicals prove advisable. Only by such planning can there be true preparation for any eventuality, and avoidance of blunders. For it is all too easy to get into an embarrassing or dangerous situation, such as discovering too late that the troops are approaching a mob against the wind.

In handling a mob by the use of chemicals, it is highly important to approach the mob from the same direction as the wind and as close as possible without undue exposure to missiles or other weapons possessed by the mob. The grenades should be ignited on, or projected to, a line upwind from the mob so that the gas or smoke cloud will envelop the rioters as it rolls forward with the wind. Usually it is desirable to start the cloud on a front wide enough to insure covering the entire assembly in case of a small or medium-sized mob. A number of small clouds may be used on a large mob in order to break it into small groups.

When it is impracticable for troops to reach a position upwind from the mob and from there release the chemicals, rifle grenades can be fired to a line from which the chemical cloud will be carried by the wind toward the mob. The rifle grenade has an extreme range of approximately 265 yards. However, when it is fired at this range it bursts in the air and starts functioning at about 210 yards range, owing to its 5-seconds fuse. But

even at this range, it is practicable in many situations to fire the rifle grenades to a line in rear of, or to one flank of, the mob. This weapon is also useful when it is necessary to project chemicals over or into buildings.

When chemicals are used, sufficient quantities should be employed to produce immediate effects. The mob should be taken by surprise if possible. Frequently the cry of "gas" and the sight of soldiers in gas masks adds a powerful psychological factor tending to disperse the mob.

Screening smoke (HC) placed on rioters causes them to lose contact and break up at least to some extent. If a tear gas cloud is added to the smoke, the dispersion is likely to be immediate. This is the gentlest way in which a mob can be handled. But if a CN (tear gas) cloud is not effective, the CN-DM grenade should be used, because this munition has a more pronounced effect than the CN alone.

When temporary disabling effects are desired, smoke from the DM candle is required. Nothing is so likely to break the resistance of a determined mob as exposure to DM smoke. The reaction (sneezing, violent headache, vomiting) is immediate, and of sufficient violence to unnerve any group. And the effects last long enough (several hours) to enable the military to clear up the situation.

When it is desired to disperse a mob, but not to capture the entire group, avenues of escape must be left open. These avenues should lead in the direction the mob is to be driven. In order to do this it may be necessary to place a chemical cloud on one side and gradually push the mob in the desired direction. Roads leading in a direction the mob should not follow must be blocked, or the chemical put on those avenues of escape as well as on the mob.

TRAINING

All men in an organization should know something about the methods of discharging or igniting chemical munitions. This training requires only a short period of instruction. However, all men in the unit need not be brought to the same degree of proficiency. A better practice is to organize in each company a "gas detail" of about 12 selected men. This detail should then be given thorough training in the tactics and technique of chemical munitions used against mobs. Such training, requiring only a few hours, will be rewarded by prompt and efficient action in emergency.

CONCLUSION

This article has covered very briefly the employment of certain chemicals in riot duty. A discussion of the legal aspects of such duty and the responsibilities of officers engaged in riot duty has been purposely omitted. A summary and digest of laws governing the use of the military in suppressing riots is presented in Military Aid to the Civil Power, published by the General Service School, Fort Leavenworth, Kansas. Excellent advice on handling mobs and riot situations is contained in Military Protection, War Department Document 882, prepared by the National Guard Bureau. Army Regulations 500-50, Employment of Troops—Enforcement of the Law, should be consulted and carefully studied by all commissioned officers.

Officers desiring to make a further study of the tactical use of chemicals, including smoke, should consult Tactics and Technique of Chemical Warfare, The Command and General Staff School, Fort Leavenworth, Kansas (1934); Chemical Warfare Tactics, Book IV, The Chemical Warfare School (1933), TR 415-15, and Chapter 8, Volume I, Basic Field Manual.

CHAPTER IX

Riot Duty Problems*

PROBLEM No. 1

A Riot in a Prison

Colonel X commands a National Guard regiment in a large city. At 4:20 PM on the 12th of May the Governor telephoned him that a riot had broken out in the State penitentiary a short distance outside the city. "Get in touch with Warden C and give him whatever aid and assistance he wants. He says he needs it, and needs it in a hurry." (See Figure 37.)

Colonel X immediately sent Captain B and 10 soldiers by truck to the prison with a supply of chemical munitions, consisting of 200 CN hand grenades and 100 HC hand grenades.

Captain B reached the prison at 6:00 PM. The warden met him and hastily outlined what had happened. The building is well constructed and fire-proof, and was built to house 800 to 1000 prisoners, but is now considerably overcrowded.

---

*These problems are based on problems appearing in Instructions for the Control of Civil Disturbances by Non-Lethal Chemicals, published by the Chemical Warfare School, Edgewood Arsenal, Maryland. They merely show the proper use of non-lethal chemical munitions in certain assumed situations, and *should not be taken as a guide for the legal use of troops.* The question of the use of troops is a matter for determination in accordance with the laws governing the particular state and local situation.

As the prisoners were assembling for a check formation in the prison yard at 4:00 that afternoon after work, they suddenly attacked the interior guards. In a few minutes they had overpowered or killed all these guards except those in the warden's office and the hospital. They seized all the guard pistols and shotguns stored in the guard office, and about 200 of the most desperate prisoners took charge, locking all the other prisoners in the cell block buildings, but not in the cells. These 200 men are now in possession of the interior of the prison. The guards, however, about 25 in number, still hold all guard towers, the warden's office, and the hospital.

Altogether the convicts have about 15 revolvers and some 10 sawed-off shotguns, with a considerable amount of ammunition. The cell blocks are in an uproar. The convicts in the yard are active in the vicinity of the printing shop.

They have just sent a message to the warden demanding that they be permitted to leave the prison, or they will release the whole prison population. The warden replied by demanding that the prisoners surrender their arms and assemble in front of his office on the parade within fifteen minutes. The prisoners promptly refused. The prison guards are well supplied with gas masks, fire-arms, and ammunition, including machine guns mounted on principal towers. Not more than twenty additional guards and policemen can be assembled within three hours to aid the prison authorities.

A shifting 4-mile breeze is blowing from the south. The sky is cloudy and threatening rain.

REQUIREMENT

What does Captain B recommend to the warden as to the use of CN grenades and HC grenades?

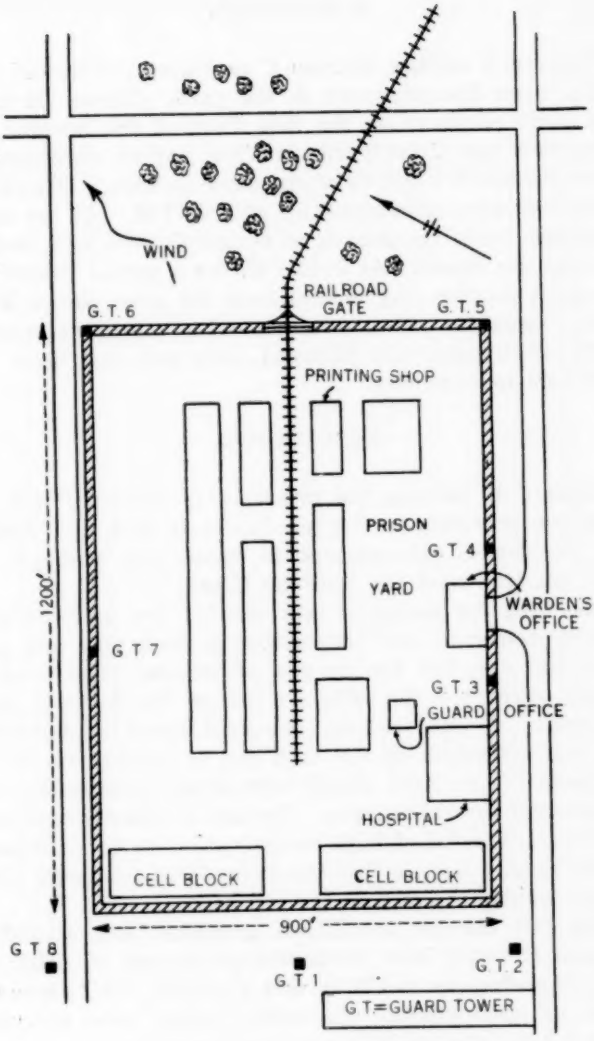

WIND
RAILROAD GATE
G. T. 6
G. T. 5
PRINTING SHOP
PRISON
YARD
G. T. 4
WARDEN'S OFFICE
G. T. 7
G. T. 3
GUARD
OFFICE
HOSPITAL
CELL BLOCK
CELL BLOCK
1200'
900'
G. T. 8
G. T. 1
G. T. 2
G. T.=GUARD TOWER

FIGURE 37

A SOLUTION

Captain B advises Warden C as follows: "Use CN grenades upon the prisoners in the yard. Throw 30 from the north windows on the first floor of the hospital, 12 from each end of the warden's office, and an additional 12 from the north windows of the same building. Throw all these grenades simultaneously at 6:40 PM. At the same time also warn the guards at Guard Towers 6, 7, and 8, to wear gas masks. At 6:45 PM, fire a second "shoot" of the same number of grenades from the same places. Then have 10 guards, with gas masks and sub-machine guns or light rifles, enter the Railroad Gate and call upon the prisoners to surrender."

DISCUSSION

Captain B believes the prisoners in the yard will release the prisoners in the cell blocks at dark and during the commotion will attempt to break out, through, or over, the wall near the Railroad Gate.

The time for action is very short. The active prison mob is desperate, and well-protected from rifle and machine-gun fire, but has no gas protection. The wind is exactly right for the effective use of the burning type grenades. A quick-acting, powerful agent is desirable. The concentrations of CN that can be quickly set up in all parts of the yard should completely incapacitate the inmates for several minutes. Captain B, therefore, recommends a CN cloud of high concentration on the prisoners in the yard, believing that the example so set would completely subdue the men in the cell houses.

Had DM candles or CN-DM grenades been available, Captain B would have recommended the use of either or both in prefreence to CN in this situation. HC grenades were not used because the smoke might have afforded cover for the convicts to escape over the walls.

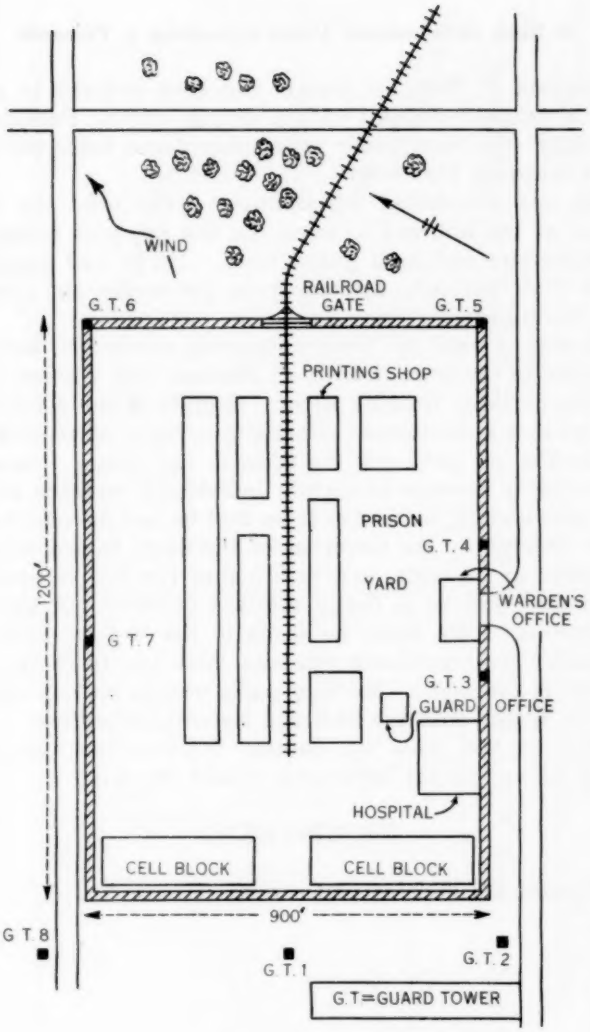

WIND
RAILROAD GATE
G. T. 6
G. T. 5
PRINTING SHOP
PRISON YARD
G. T. 4
WARDEN'S OFFICE
G. T. 7
G. T. 3
GUARD OFFICE
HOSPITAL
CELL BLOCK
CELL BLOCK
1200'
900'
G. T. 8
G. T. 1
G. T. 2
G. T=GUARD TOWER

FIGURE 37

PROBLEM NO. 2

A Mob Determined Upon Lynching a Prisoner

Captain B, National Guard, has been ordered to protect a prisoner charged with a serious crime. Captain B has fifty (50) men under his command and holds the jail area shown in Figure 38.

He has established his company tents near the tool house of the jail, and is using the tool house as company headquarters and as a guard room. He is well supplied with rifles, bayonets, machine guns, gas masks, and chemical munitions.

A mob of men and boys, numbering about 200, has assembled in the edge of town on Highway No. 7 about half a mile north of Roaring River. Captain B has a reliable report that a determined effort will be made after dark to storm the jail and lynch the prisoner held there. Captain B writes a message to certain individuals reported to be the mob leaders, informing them that he and his men have been ordered by the Governor of the State to protect the prisoner at all costs, and to see that the law is upheld. He states that he is firmly resolved to carry out his instructions. This letter he sends to the mob by two responsible local residents who can later testify to its delivery, if necessary. He then sends men in civilian clothing to mingle with the mob and learn its intentions.

At 7:00 PM, June 1st, Captain B learns that the mob is on its way up the highway to attack the jail.

REQUIREMENT

Captain B's decision and actions.

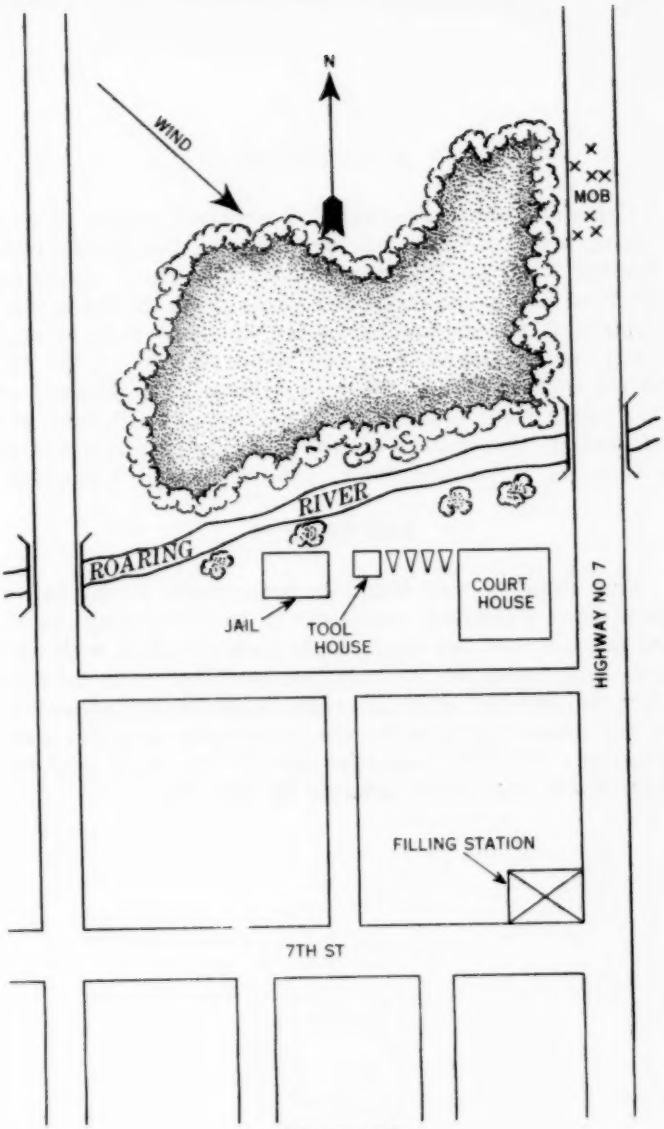

N
WIND
MOB
RIVER
ROARING
JAIL
TOOL HOUSE
COURT HOUSE
HIGHWAY NO 7
FILLING STATION
7TH ST

FIGURE 38.

A SOLUTION

Captain B sends Lieutenant Z and two squads of men armed with tear gas rifle grenades to the bridge over Roaring River on Highway No. 7. This detail moves up the road to a point about 200 yards north of the bridge. Captain B directs another detail of three men to stop traffic on the highway at the filling station on the 7th Street corner. When the mob arrives at a distance of 300 yards from the bridge, Lieutenant Z, following out his orders, fires volleys of tear gas rifle grenades (16 at a time, on a 100-yard front) upon it until it disappears.

DISCUSSION

This situation was distinctly unfavorable to the use of hand-thrown chemical munitions or to slow acting chemical munitions of any kind. Rifle grenades filled with tear gas would break up the mob formation before it came so close that machine guns and rifles would become necessary. A few minor casualties by the falling rifle grenades were expected; but such casualties are for the most part far less serious than those inflicted by rifle fire.

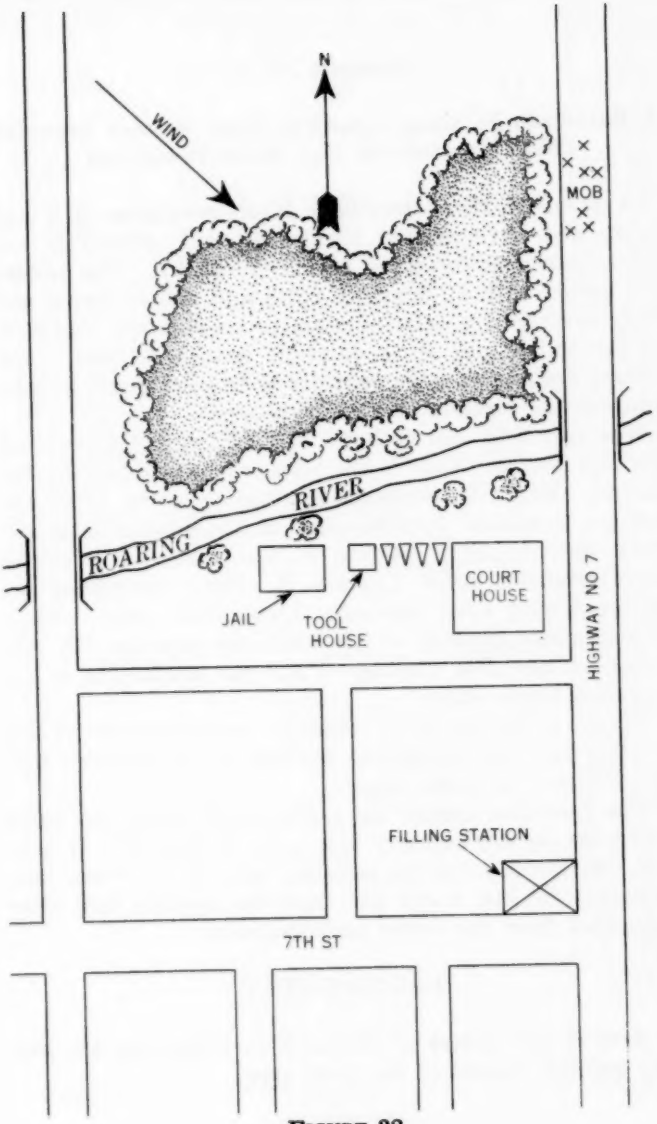

N
WIND
MOB
RIVER
ROARING
JAIL
TOOL HOUSE
COURT HOUSE
HIGHWAY NO 7
FILLING STATION
7TH ST

FIGURE 38.

PROBLEM NO. 3

A Barricade In Open Country, With Rioters Provided With Commercial Gas Mask Protection

A group of 250 rioters have taken possession of a coal mine, and have erected barricades that effectively cut off entrance to the mine (See Figure 39). The rioters are armed with 50 sporting rifles and 200 shotguns and have advertised a determination to prevent the operation of the mine until their demands have been met. The rioters are known to be provided with good grade goggles and dust respirators of the snout type.

The Governor has declared martial law. Major X, of the Nth National Guard, has been ordered to disperse the rioters. Major X commands a battalion of two rifle companies: Company A, consisting of 75 enlisted men and three officers under Captain A; and Company B of the same strength under Captain B. Both companies are equipped with rifles, bayonets, 4 automatic rifles, pistols, and an ample quantity of CN-DM hand grenades, CN rifle grenades, and DM candles. Fifty gas masks are in the battalion supply train.

Major X has made an airplane reconnaissance of the location and has plotted the position of the striker's barricades upon accurate maps.

The battalion arrives by motor truck from the north and halts on the highway just west of Coal Hill at 3:30 PM. Major X joins the battalion just as it arrives, having come by fast motor car from the landing field after returning from the aerial reconnaissance.

REQUIREMENT

Actions and orders of Major X in dispersing the mob and gaining control of the mine area.

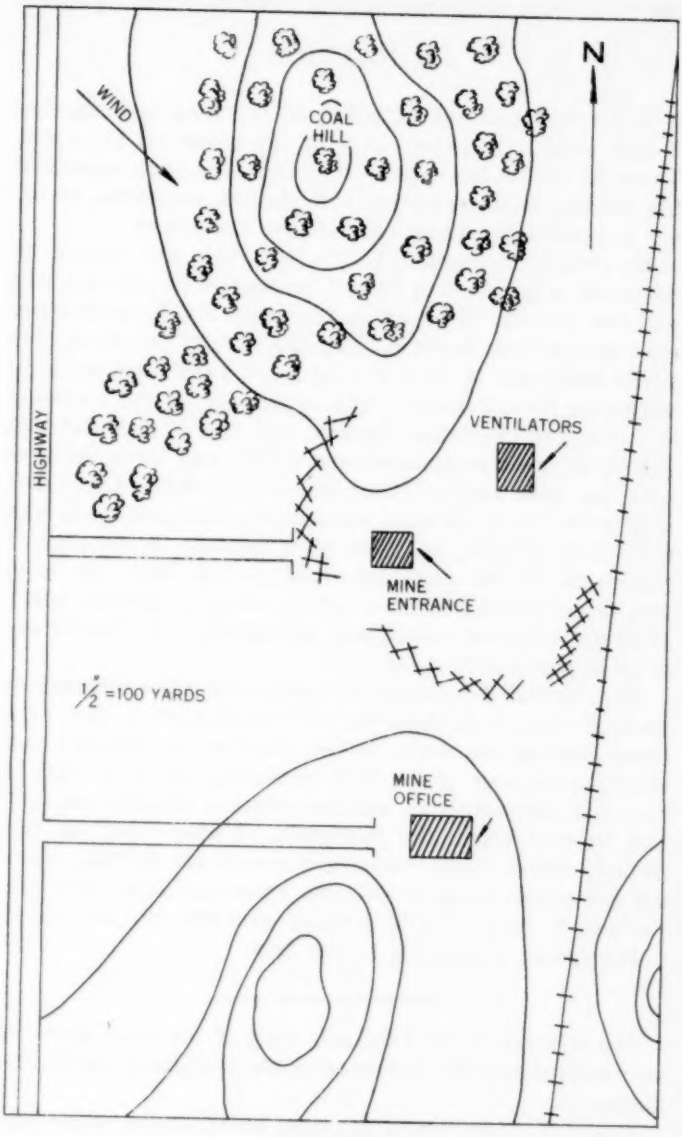

N
WIND
COAL
HILL
HIGHWAY
VENTILATORS
MINE
ENTRANCE
½" =100 YARDS
MINE
OFFICE

FIGURE 39.

A SOLUTION

Major X forms the battalion on the road and marches it east until it is under cover of the woods on Coal Hill. There he orders his men to lie down, and then assembles his officers, first sergeants, and platoon sergeants, in order to outline the situation and give his orders.

He orders Lieutenant L, the battalion gas officer, to command a detachment from Company A of one sergeant and two squads. This group is to take 2 DM candles per man and get into position along the edge of the woods 200 yards southwest of Coal Hill on a 250 yard front running southwest by northeast. The remainder of the company is to form the battalion reserve, and also to establish two patrols of one noncommissioned officer and three privates each, one west and the other east of Coal Hill. Captain B is to select 50 of his men, issue each man a gas mask and a CN-DM grenade, and take up a position in the edge of the woods on the southeast slope of Coal Hill. He is to post the remainder of the company so as to provide small-arms fire to cover subsequent operations. All details are to be in position by 4:00 PM.

At 4:00 PM, Lieutenant L, commanding the detachment from Company A, fires 16 DM candles on a 250 yard front, placing the center of the cloud on the strikers barricaded just west of the mine entrance. At 4:10 PM, he fires his remaining 16 candles, placing candles on, and just upwind from, the barricade. Under cover of this irritant smoke cloud, Captain B moves his 50 men wearing gas masks to the ventilating house and mine entrance. Captain B uses CN-DM irritant grenades on any barricaded groups remaining in the area.

The strikers in the barricade west of the mine entrance surrendered and the mob holding the remaining barricades dispersed.

Major X then moved his men to the mine office and established camp in the open field to the south of the of-

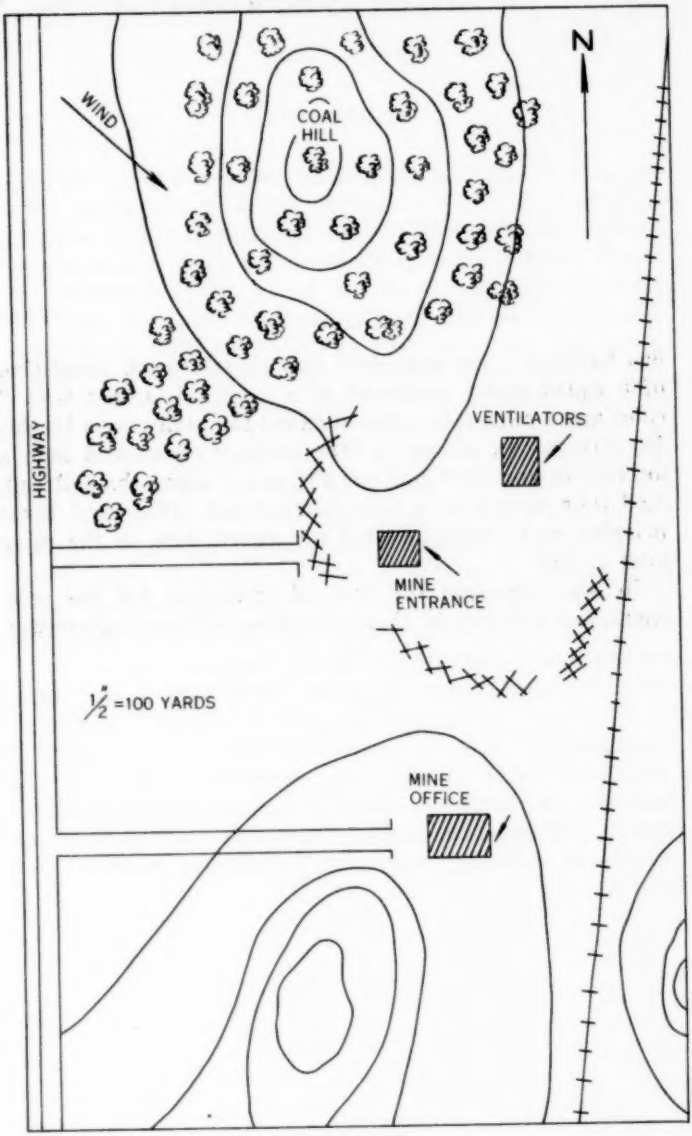

N
WIND
COAL
HILL
HIGHWAY
VENTILATORS
MINE
ENTRANCE
1/2 =100 YARDS
MINE
OFFICE

FIGURE 39.

fice building. He organized two patrols, each consisting of a squad under command of a sergeant, armed with 7 rifles and 1 automatic rifle, to patrol the highway in trucks. He directed an officer to take another squad and man a locomotive and steel coal car for patrol along the railroad. And four patrols of a noncommissioned officer and three privates each, were detailed for guard duty in the mine area proper.

He also arranged for first-aid treatment for the prisoners, and delivery of them to higher military authorities.

DISCUSSION

As the rioters had goggles and miners' masks, tear gas (CN) would not be effective; hence Major X used more powerful chemical weapons. The DM candle was chosen for a surprise attack on the whole force of rioters Under the conditions of wind and terrain it was best to cover the whole barricade with a high and incapacitating concentration of DM smoke. The first barricade just north of mine entrance should receive a particularly heavy concentration. Two separate clouds were released, the second to take care of the most stubborn members of the mob, for the less determined would disperse after the first. By the use of this munition, he penetrated the protection afforded by the miners' goggles and masks, and destroyed their fighting resistance without causing permanent injury. And moreover, since DM smoke is effective in the open for about ten minutes only, the unmasked soldiers could follow up the cloud with impunity. None would be incapacitated unless they actually entered the cloud. As a precaution, however, masks were worn by the men of Company B upon entering the gassed area.

Subsequent actions were merely to take advantage of the initial results obtained and clear the area of the mob.

This example illustrates again the value of chemical agents in getting immediate incapacitating results by the use of a small quantity of munitions in a surprise attack.

PROBLEM NO. 4

A Disorderly Street Gathering

A large number of rioters have created much disturbance in Hopkins, a mill town of about ten thousand population. Several grocery stores, one department store, and a bank have been broken into and looted. The local police have killed two members of the mob and wounded several others. The rioters in turn have fired on the police, thrown rocks at the police station, and have threatened to kill any policemen found on the street. The mob has been in control of the town for a day and a night.

Captain C commands Company C of the Xth National Guard, located in Hometown about 35 miles away. (See Figure 40).

At 4:00 PM Captain C sends forward Lieutenant X and Sergeant Y in civilian clothes by private automobile to observe the situation in Hopkins, and then report to him at a convenient place on the route.

At 6:00 PM, he assembles 50 men of his company and proceeds by motor transportation toward Hopkins.

The company is armed with 12 automatic pistols, 32 rifles, 6 automatic rifles, ample ball ammunition, 11 gas masks, 50 Grenades, Hand, Tear, CN, M7, and 50 Grenades, Hand, Smoke, HC, M8.

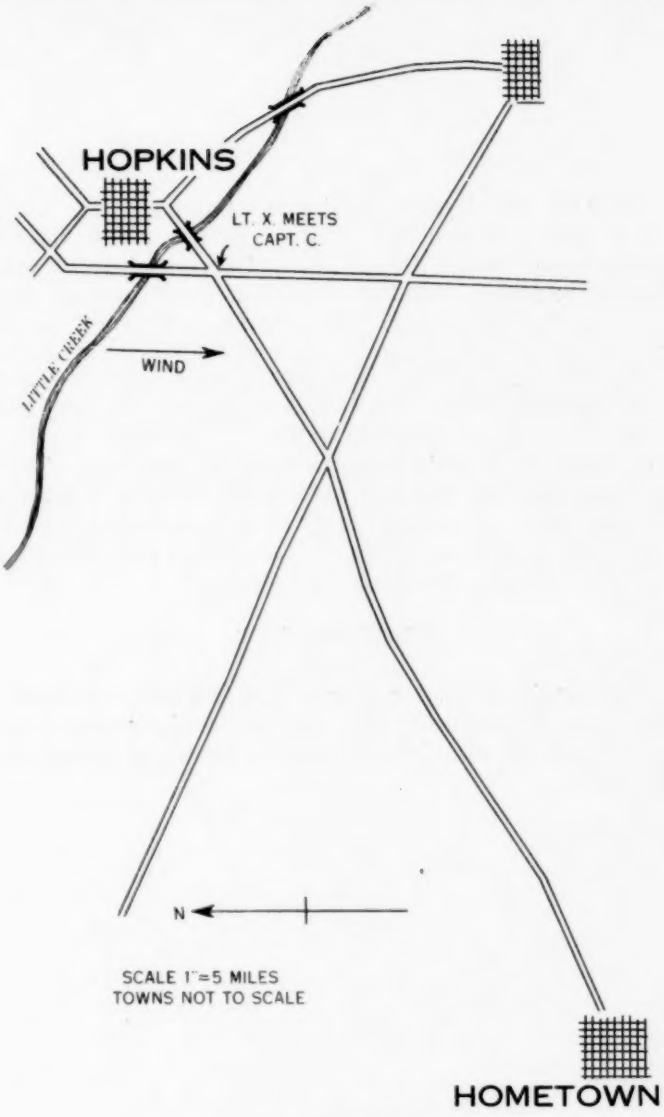

HOPKINS
LT. X MEETS
CAPT. C.
LITTLE CREEK
WIND
N
SCALE 1"=5 MILES
TOWNS NOT TO SCALE
HOMETOWN

FIGURE 40.

At 8:30 PM, Lieutenant X meets Captain C five miles from town and reports: "There are about 500 rioters in the town. About 200 are in small groups of five or six. One large mob of 300 has assembled in the business district on the main street. (See Figure 41.) There is little effective leadership or control of the mob. It is believed they intend to break into several large jewelry and department stores later in the night. Main Street runs north and south. A gentle north wind is blowing. The City Hall is on Main Street several blocks north of the business district. The city water works and gas plant are located about half a mile north of town and a mile from the business district. Sergeant Y will meet the captain at the city hall with the latest information."

REQUIREMENT

Captain C's plans for approaching the town, including the route of approach; the distribution of chemical grenades; and his plan for entering the town and dispersing the mob.

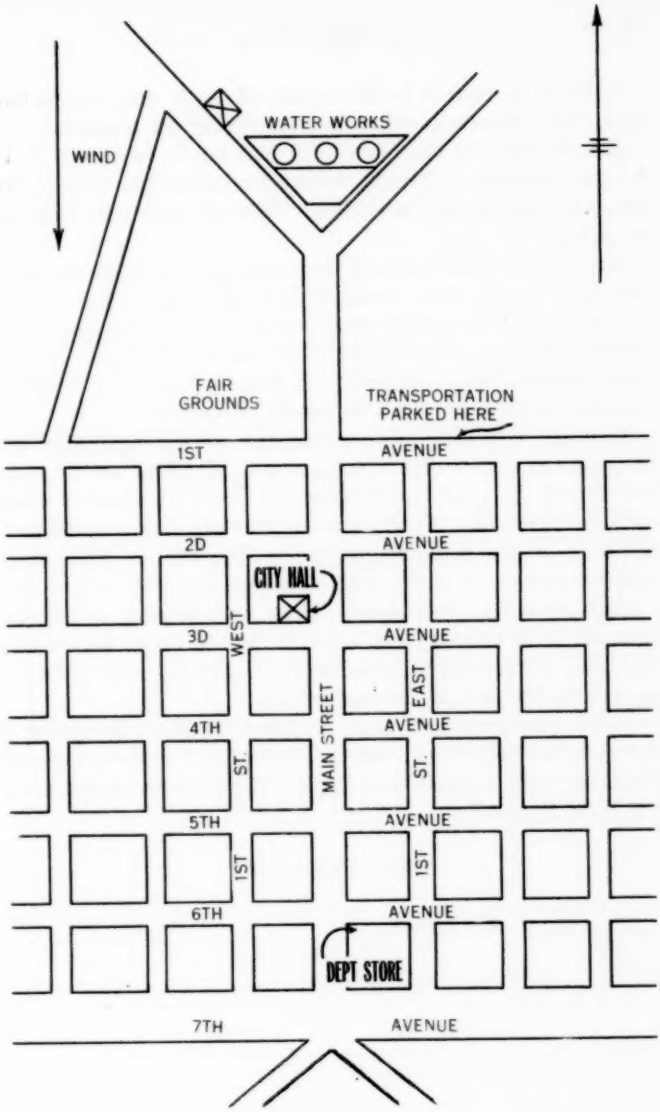

WATER WORKS
WIND
FAIR GROUNDS
TRANSPORTATION PARKED HERE
1ST AVENUE
2D AVENUE
CITY HALL
3D AVENUE
WEST
MAIN STREET
EAST
4TH AVENUE
ST.
ST.
5TH AVENUE
1ST
1ST
6TH AVENUE
DEPT STORE
7TH AVENUE

FIGURE 41.

A SOLUTION

Captain C passes to the north of town and approaches from that direction with as little delay as possible.

He proceeds to the open field just north and east of 1st Avenue and Main Street, where he parks his transportation and leaves two automatic riflemen and two riflemen on guard.

He details Lieutenant X to command 10 men equipped with gas masks, and armed with 8 automatic pistols and 2 automatic rifles, and 50 smoke and 50 tear gas hand grenades. He tells Lieutenant X to move his detail to City Hall, confer with Sergeant Y, then attack and disperse the mob with tear gas and smoke grenades.

Captain C divides the remainder of his company into two detachments. He conducts one of these south along 1st Street, E., and has Lieutenant Z lead the other south on 1st Street, W. Both detachments are to regulate their advance on the movements of Lieutenant X. Captain C and Lieutenant Z, with their detachments will arrest such rioters as come their way. Both detachments must stay upwind from the tear gas cloud to be set up by Lieutenant X. All detachments are ordered not to use firearms except in the actual defense of life.

When Lieutenant X reaches the City Hall, Sergeant Y delivers the following report: "About 200 rioters are now breaking into a large department store three blocks south on Main Street."

REQUIREMENT

Lieutenant X's action.

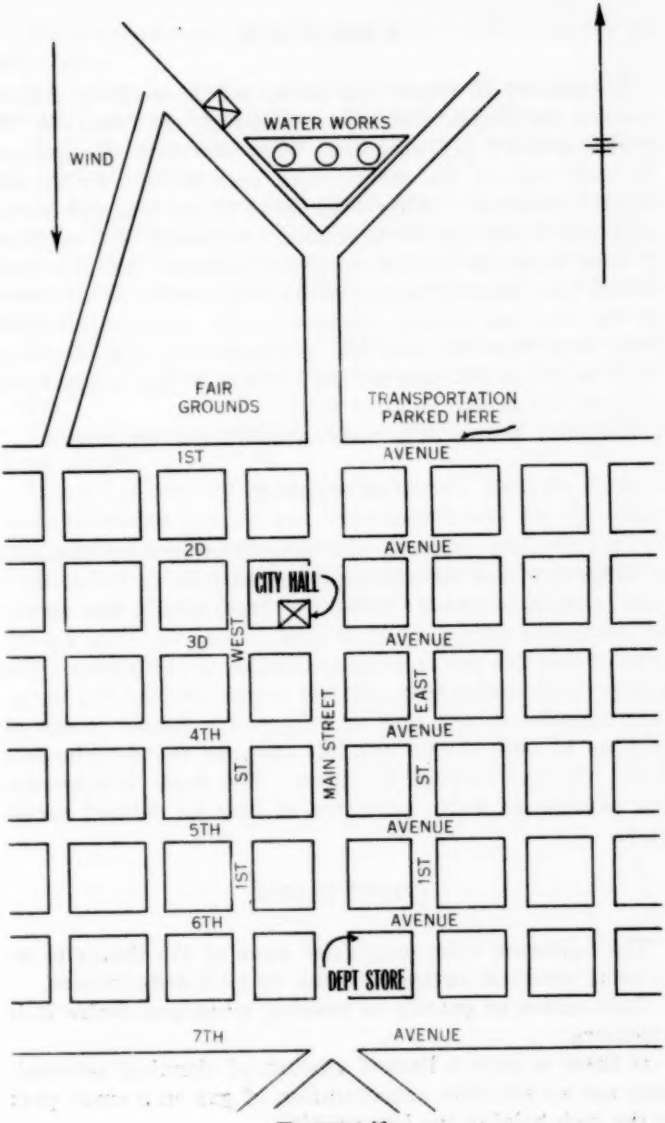

WATER WORKS
WIND
FAIR GROUNDS
TRANSPORTATION PARKED HERE
1ST AVENUE
2D AVENUE
CITY HALL
3D AVENUE
WEST
MAIN STREET
EAST
4TH AVENUE
ST
ST
5TH AVENUE
1ST
1ST
6TH AVENUE
DEPT STORE
7TH AVENUE

FIGURE 41.

A SOLUTION

Lieutenant X moves his group south on Main Street, toward the department store. His men each carry 5 CN grenades and 5 HC grenades. They march in two groups, on each side of the street, with each headed by an automatic rifleman. After they move about 2 blocks south, each man throws 2 CN grenades. Lieutenant X fires three or four grenades himself for good measure. All men then adjust gas masks, wait two minutes, and, under cover of the tear gas screen, advance to the department store. They then fire CN and HC grenades into this building from all sides and capture the looters as they stagger out through the smoke and gas cloud.

Sergeant Y acts as a rearguard for this detachment.

DISCUSSION

This problem indicates the general method of handling a dangerous mob situation as well as how to break up a mob already formed. Note the tremendous fire power of this organization, which is kept in reserve. The knowledge of this fire power gives confidence to the soldiers. The relatively harmless tear gas and smoke provide the necessary impulse to put this mob to rout. Ample routes of escapes to both flanks are left open as the detachments move into and through the town. The flank detachments can capture as many prisoners as may be deemed necessary.

CONCLUSION

The following rules emphasize some of the things to do in using chemical agents to break up civil disturbances.

Take action as quickly as possible when you decide it is necessary.

If there is only a limited amount of chemical ammunition, use an effective concentration of gas on a small part of the mob holding the key position.

Always maneuver so as to approach a mob from the upwind side.

Select squads or other appropriate groups and give them special training in handling chemical munitions.

Drift the chemical cloud onto the mob without getting into brickbat range.

Do not place a chemical cloud where it will defeat its object. Generally you wish to break up the mob. Therefore, leave avenues of escape open. Do not block such avenues of escape with chemical agents used indiscriminately.

Do not place smoke where it will provide cover for mob members to reach points disadvantageous to the military force.

Do not subject military personnel to gas unless they have masks.

When the number of masks is limited, keep the bulk of your command upwind and use masked men for the chemical squad and its fire support

Men firing chemicals should be regarded as supporting troops and should be given protection by riflemen.

CHAPTER X

Small Problems—Infantry

(HISTORICAL)

Problem No. 1

By the close of the second day (August 25, 1914) of the retreat of the British Expeditionary Force from Mons, the 4th Guard Brigade had reached Landrecies, where it was to billet that night. (See Figure 42.) The day's march had been a most exhausting one, beginning in the early morning hours and continuing throughout the day under a blazing sun. The Germans were pursuing closely, filling every road leading southward to Paris.

Nos. 1 and 3 Companies of the 3d Coldstream Guards were detailed to outpost the road to the north from Landrecies. This road, on leaving the village, crosses the Sambre River and then, about 50 yards farther on, a railroad. For the next 200 yards it is bordered on either side by a row of cottages, called Faubourg Soyeres. Some distance beyond the cottages the road forks, the one to the left leading to Englefontaine and the other bearing due north through the Forêt de Mormal. Both the forest and Englefontaine roads are bordered by massive hedges interwoven with wire, practically confining movement to the roads.

The support company of the Coldstreams remained in Landrecies while the outpost company moved into Faubourg Soyeres. The picket (about three squads) was posted near the northernmost cottages. A sentry post (about four men), with a machine gun, was placed in po-

sition at A, on the right (east) of the road, nearer the fork, from where the main road to Englefontaine could be covered by fire.

About dusk, civilians fleeting in terror from their homes, reported that German cavalry was approaching followed by infantry and cannon. Shortly afterward a German cavalry patrol appeared in the gathering darkness, on the Englefontaine road at the fork (B). It was fired upon by the machine gun. Two of the patrol dropped, but the remainder galloped back by way of the forest road, the Englefontaine road being smothered by the fire of the British sentry post.

REQUIREMENT

Action of Captain Monck, the commander of the outpost company.

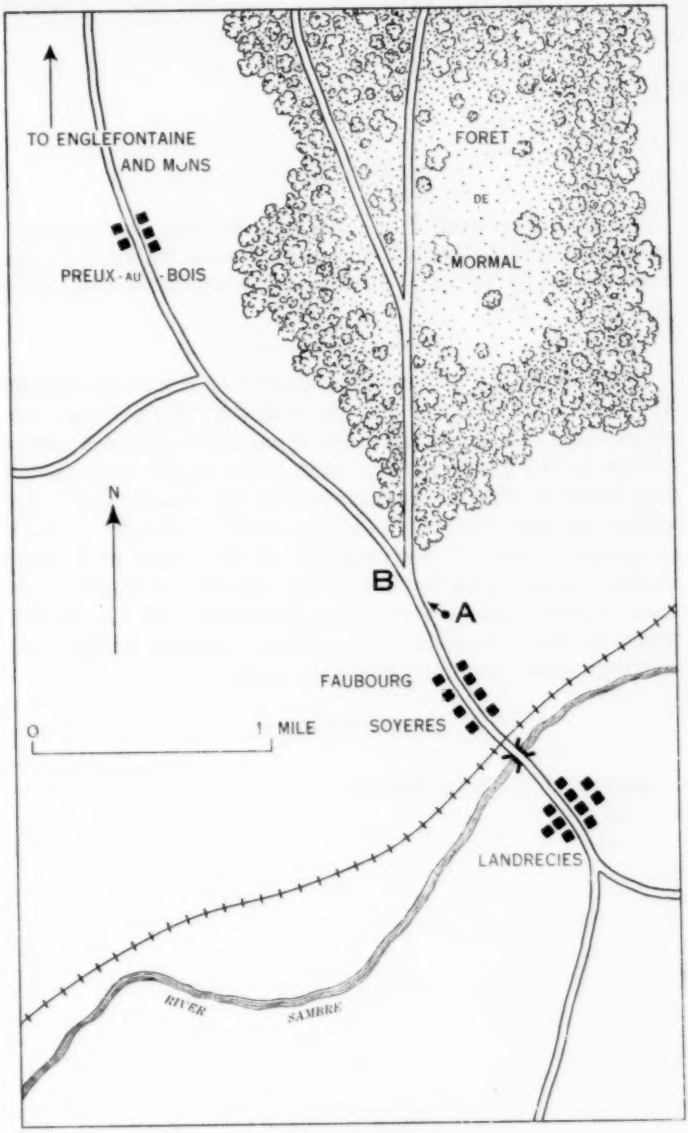

TO ENGLEFONTAINE
AND MONS
PREUX-AU-BOIS
FORET
DE
MORMAL
N
B
A
FAUBOURG
SOYERES
0
1 MILE
LANDRECIES
RIVER
SAMBRE

FIGURE 42.

SOLUTION

As the forest road could not be seen from the machine-gun position, the sentry post was moved forward to the road fork (B) so as to be able to sweep both roads with fire.

In about thirty minutes, the sounds of rumbling wheels, the tramp of infantry and the songs of the German soldiers came out of the darkness from the northwest, somewhere on the Englefontaine road. The picket was alerted and Captain Monck ran forward to the sentry post. He called out the challenge and received a reply in French "friends." But, at that instant, in the beam of a light flashed up the road by one of his sentries he beheld German soldiers only a few yards from him, and, some distance to their rear, the dim outline of men, horses, and artillery guns, jamming the wide road.

REQUIREMENT

Action of Captain Monck.

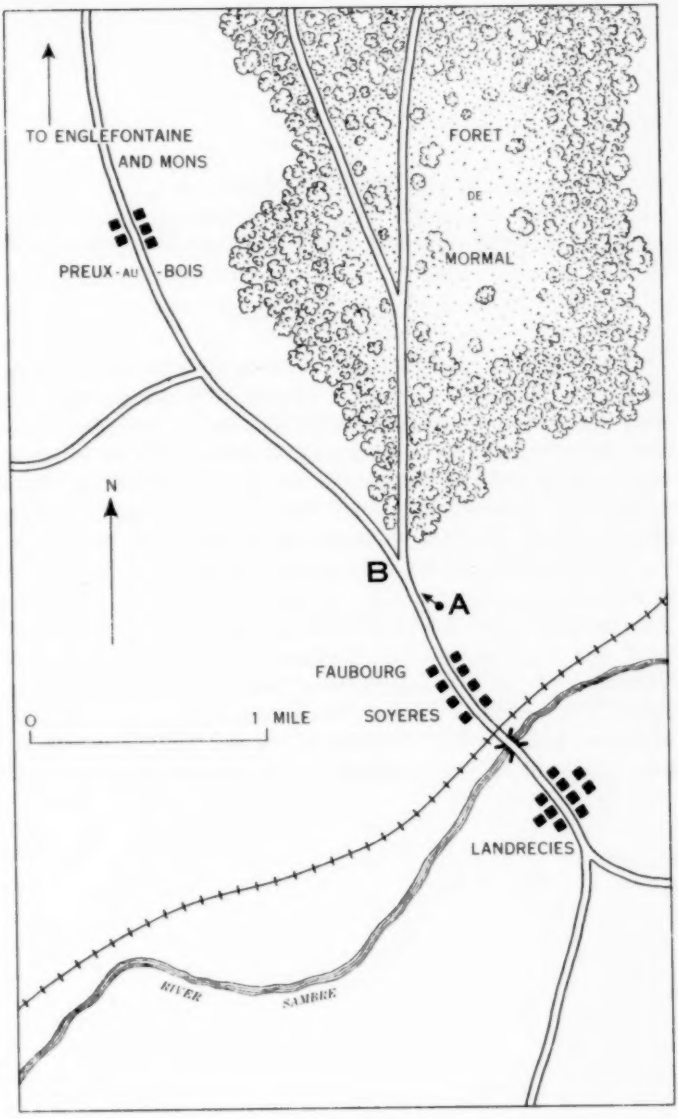

TO ENGLEFONTAINE
AND MONS
PREUX-AU-BOIS
FORET
DE
MORMAL
N
B
A
FAUBOURG
SOYERES
0
1 MILE
LANDRECIES
RIVER
SAMBRE

FIGURE 42.

SOLUTION

Captain Monck at once gave orders to the sentry post to fire.

The Germans charged but Private Robson at the machine gun was able to send a stream of bullets down the road before the Germans reached and bayoneted him. Captain Monck and the remaining sentries, after firing a volley, beat a rapid retreat to the picket, reaching there unharmed. The entire picket then ran forward and the few Germans who had charged the sentry post withdrew.

The Germans had so battered the machine gun there that it was useless. But while Private Robson had kept the gun in action, its fire had been most effective. He had fired one long burst—into darkness, it is true—but also into the mass of men and horses that completely filled the road. The German infantry took cover, leaving dead and wounded in the road. The horses of the leading-gun team were brought down, crushing their riders. The battery

commander of the leading battery and his second-in-command, fell. Horses reared and lunged; some, breaking free, galloped back through the column leaving upturned guns and limbers in their wake. Colonel Von Below, the German commander, though near the head of the column, was unharmed. As soon as the first confusion of surprise was over he ordered his leading battalion to work forward to Landrecies.

Captain Monck, judging from the sounds of confusion, and the cries of dying men and horses, knew that the German column was in a state of chaos, particularly as it was hemmed in by the hedge on either side of the road. As the picket's only machine gun was out of action, it had no automatic weapons, being armed with rifles only.

REQUIREMENT

How would you employ the fire power of the riflemen (about sixteen in number) who were now at the position of the sentry post, in order to cover effectively the Englefontaine road?

SOLUTION

The British fired by volley. The fire commander whistled; then gave the word of command, upon which the men emptied their magazines, firing down the road into the darkness ahead.

DISCUSSION

The Germans quickly sensed the rhythm of such type of fire. At the sound of the whistle they rushed to cover, again moving forward as soon as the burst of fire was over. A donkey, evidently a German sympathizer, warned them of each impending burst by braying in a most penetrating pitch each time the British fire-commander blew his whistle preparatory to the firing. In the intervals of the firing the Germans were able to unhook two guns of the second battery in column, and move them to an open field on the east of the road, first cutting a passage thru the hedge.

In this situation the British picket could have better kept the road under fire by dividing into three or four groups, each group in turn firing the contents of one magazine as rapidly as possible and then reloading while the other groups were firing. The fire-commander could have moved in the dark from one group to the next, controlling the fire as effectively as fire by volley. And the fire, being almost continuous, would have denied the road to the Germans. *A high degree of fire control is essential, particularly at night; but it should not be gained by volley fire, if fire effect is thereby reduced.*

CONCLUSION

The reader will undoubtedly question why the German artillery and infantry were caught in mass formation a few hundred yards in rear of the point of their advance guard.

Late in the afternoon of August 25, the German 7th Divsion reached Englefontaine where it was to remain for the night. Its 27th Infantry, with three batteries of artillery and a squadron of Hussars, was to outpost the Englefontaine road as far south as Preau-au-Bois, with other outpost troops to the west. But about 7:00 PM, just after the 27th Regiment reached its outpost position, it was ordered to move about a milè south and occupy Landrecies, as the English were in full retreat. A cavalry patrol was sent out; then the point of the advance guard, followed closely by the remainder of the advance guard, with the main body only 300 yards in rear.

All ranks had only one thought in mind, dinner and bed at Landrecies. With a cavalry patrol in front there would be no danger in closing up and in making the last lap in record time. But, as the reader has learned, the cavalry patrol had been forced on to the forest road, with massive hedges and dense undergrowth on either side, and could not get back to the column in time to warn it. The road being wide, the artillery moved out of its place in the column and abreast of the infantry. All units closed on the point. Even the baggage train trotted forward, shortening the column but completely filling the road. The commanding officer, when only a few hundred yards from the road fork where the Coldstream machine gun was located, trotted forward with his staff, for the purpose of allotting billets in Landrecies. At this moment the British machine gun opened up and "hell broke loose".

The fighting continued until about 2:00 AM, both the English and Germans being reinforced. But about two o'clock, the German commander decided that his chance of sleeping in Landrecies that night was most remote, and so halted his attack. The English were very willing to forego further encounter. By 3:00 AM they were moving southward from Landrecies. And at 4:30 AM, the Germans were having a hot meal from their soup kitchens but were still north of Landrecies.

PROBLEM NO. 2*

On the morning of October 4, 1918, the 58th U. S. Infantry was attacking in a direction of the Bois de Fays from east of Nantillois (See Figure 43) in column of battalions. The 3d Battalion was leading the attack, followed by the 1st and 2d in that order.

As the regiment moves forward, Company H (a rifle company) leads the 2d Battalion, with Company E following at about 125 yards. On reaching the Bois de Fays, H Company is to move to the right to a position along the eastern edge of the woods. E Company is to continue to the Cunel road, then turn to the right and advance to the eastern edge of the Bois de Peut de Faux, and there take up a position facing east astride the road, extending H Company's line to the north.

But shortly after Company H crosses the road leading northeast out of Nantillois, German machine-gun fire, coming generally from the west, slows up its advance. Seeing the predicament of Company H, the company commander of E company changes his direction of attack, obliquing to the northeast to avoid the hostile fire, instead of following H Company directly. Thus, by the time that unit has managed to get within roughly 300 yards of the Bois de Fays, Company E has come abreast of it somewhat to the right.

Just then, however, the enemy machine guns cease their fire, so that both companies can now advance with greater ease. But the company commander of Company E realizes that if both companies enter the Bois de Fays at the same time, H Company will have to pass through his own in moving to its objective. This is liable to cause considerable confusion and intermingling of units in the dense woods, and make control of his company extremely difficult.

---

*Based upon the personal experience monograph of Captain John E. Hull, Infantry.

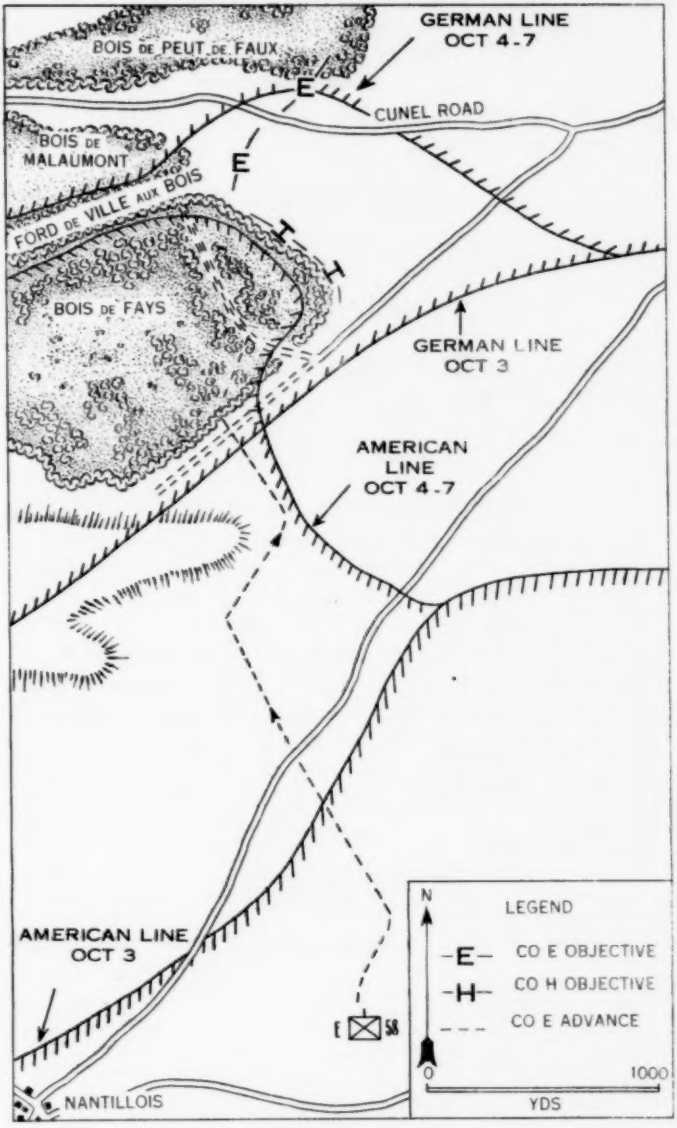

GERMAN LINE
OCT 4-7
BOIS DE PEUT DE FAUX
E
CUNEL ROAD
BOIS DE
MALAUMONT
E
FORD DE VILLE AUX BOIS
H
H
BOIS DE FAYS
GERMAN LINE
OCT 3
AMERICAN
LINE
OCT 4-7
AMERICAN LINE
OCT 3
E 58
NANTILLOIS
N
LEGEND
E CO E OBJECTIVE
H CO H OBJECTIVE
CO E ADVANCE
0
1000
YDS

FIGURE 43.

Company E is now in column of platoons, and each platoon is in a line of squad columns. An occasional enemy shell strikes in or near its position. It is receiving no other hostile fire.

REQUIREMENT

The decision of Captain Company E.

SOLUTION

Captain Company E halts his company until Company H gains the woods.

DISCUSSION

In this situation Captain Company E knew that halting his company in the open would expose it to view and to possible hostile fire. Nevertheless, he preferred this evil to becoming tied up with Company H in the dense woods and thus losing control of his unit.

As the last man of Company H disappears into the woods ahead, hostile machine guns again open up, sweeping with their fire the trail along the southern edge of Bois de Fays. Company E is still about 200 yards from the trail and has to cross it to reach the woods. The fire comes from the east this time, but it is impossible to spot the guns.

REQUIREMENT

How does the captain get his company across the trail?

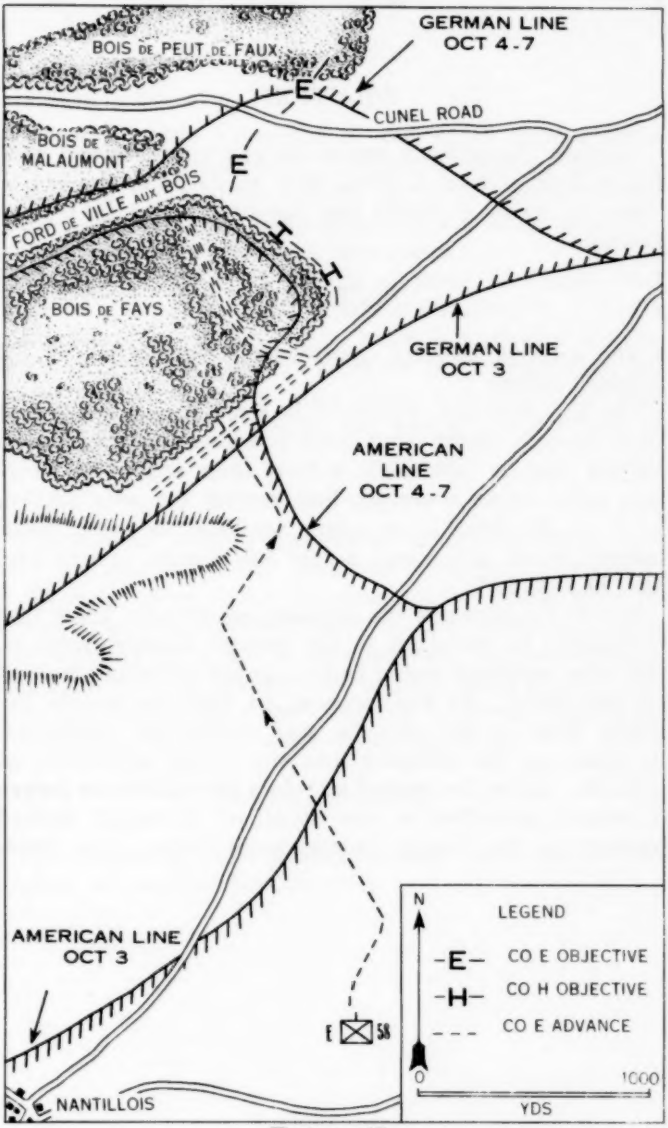

GERMAN LINE
OCT 4-7
BOIS DE PEUT DE FAUX
E
CUNEL ROAD
BOIS DE
MALAUMONT
E
FORD DE VILLE AUX BOIS
H
H
BOIS DE FAYS
GERMAN LINE
OCT 3
AMERICAN
LINE
OCT 4-7
AMERICAN LINE
OCT 3
E 58
NANTILLOIS
N
LEGEND
-E- CO E OBJECTIVE
-H- CO H OBJECTIVE
- - - CO E ADVANCE
0
1000
YDS

FIGURE 43.

SOLUTION

Captain Company E moves his company forward until the leading platoon is about fifty yards from the woods. Then he sends it across the fire-swept zone in platoon rushes.

DISCUSSION

The solution appears unorthodox. Paragraph 1*i*, TR 420-105 states:

"In the approach march it is sometimes necessary to pass through enemy long-range machine-gun fire. Squad leaders may be directed to reform their squads at a certain point or on a certain line beyond the area shelled. * * * If there is no cover available, he (the squad leader) works his squad across by bounds, one or two men at a time."

But in his situation the company commander knew that the longer he remained in his present exposed position, the more imminent would be the danger of being observed by the enemy. At any moment, in fact, the hostile fire might shift to the area he was occupying. Therefore, he must get his company into the woods as quickly as possible. Again, he desired to retain the maximum degree of control permitted by the situation. If squads worked forward to the woods independently, they were liable

to become widely separated in the dense undergrowth. Whereas if platoons were kept intact, crossing the fire-swept trail by platoon rushes, he could regain control of the company with little difficulty and could promptly start the movement through the woods.

This brings out very clearly a point of tactics that must be understood. The methods described in training regulations are in no sense rules but merely guides. Each situation with which a leader is confronted is different from every other. The leader who knows his men and the ground will not go far wrong in his choice of methods.

Company E reaches the shelter of Bois de Fays with very few casualties. The going in the woods is most difficult, made more so by the shelling the woods have received from our artillery prior to the attack and from the hostile high-explosive shrapnel and gas now falling. The density of the undergrowth and the thick woods limits observation to only a few feet. It is almost impossible to maintain direction under such conditions.

REQUIREMENT

The formation while moving through the woods and the method of maintaining direction.

SOLUTION

The company moves through the woods in single file, the leading guide maintaining direction by compass.

DISCUSSION

Up to the time of entering the Bois de Fays, the company had been in a column of platoons, each platoon in line of squad columns. Movement through the woods in the same formation would have meant confusion, and loss of control and mobility. It was also impracticable for squads to remain within sight of those to their front and flanks, even though distances and intervals were reduced. Maintainence of direction in attack is always an essential, and in this case, it was greatly facilitated, if not insured, by placing the entire company in column of files. On the other hand such a column formation is more vulnerable and open to surprise. As things were, however, *direction, control* and *mobility* again proved rightly to be the deciding factors of the situation, and led the company commander to adopt a column-of-files formation.

Company E starts through the woods by compass direction in single file. It soon stumbles into a trail leading a little to the west of north. Movement through the tangled underbrush and shell-broken trees is so difficult and fatiguing that the company commander decides to try this trail. Fortunately the enemy has no machine gun planted at the far end of the trail. If he had he could sweep the trail with fire, putting an end to the operations of Company E, 58th Infantry. The company meets no resistance, however, and now moves rapidly through the woods along the trail.

Machine-gun and rifle fire can be heard to the front and left flank, and also at some distance to the right. But the company continues to push forward at a good pace and arrives near the northeastern edge of the Bois de Fays about 11:00 AM.

The company commander moves up to the edge of the woods to look over the ground. He sees the Cunel road, the Bois de Peut de Faux to the north of it, and the Bois de Malaumont a short distance to his left front. He now assembles his platoon leaders and directs:

1st Platoon will deploy and move along the eastern edge of the woods to our left front, Bois de Malaumont, to the Cunel road; then move east along the road and take up a position along the eastern edge of those woods, Bois de Peut de Faux.

2d Platoon will take up a defensive position along the eastern edge of the Bois de Malaumont and northeastern edge of the Bois de Fays.

I will move the remainder of the company into the Bois de Malaumont and take up a supporting position south of the Cunel road. Each platoon will contact the units on its flanks.

The company commander notes as he gives his orders that the frontage of each front-line platoon is far more than each should handle; but such an assignment is in conformity with the order received from his battalion commander. He feels he should attempt to cover the entire front.

The 1st Platoon is forming preparatory to moving out, when the commander of the 1st Battalion (the second battalion in the attack) arrives. He says that the 3d Battalion (the leading battalion) has been stopped along the Cunel road. He strongly advises against E Company's moving any farther forward. Captain Company E halts his platoon while he checks this information. He goes about 300 yards west along the Fond de Ville Aux Bois to the C.P. of the 3d Battalion. There he learns that the 3d Battalion is still south of the Cunel road and is unable to push farther forward, and that the leading units of the division on the left have not been able to advance for sometime and are now about 1,500 yards to the left rear. The commander of the 3d Battalion is considering withdrawing his companies to the Font de Ville Aux Bois and believes it would be useless and suicidal for Company E to move forward from Bois de Fays.

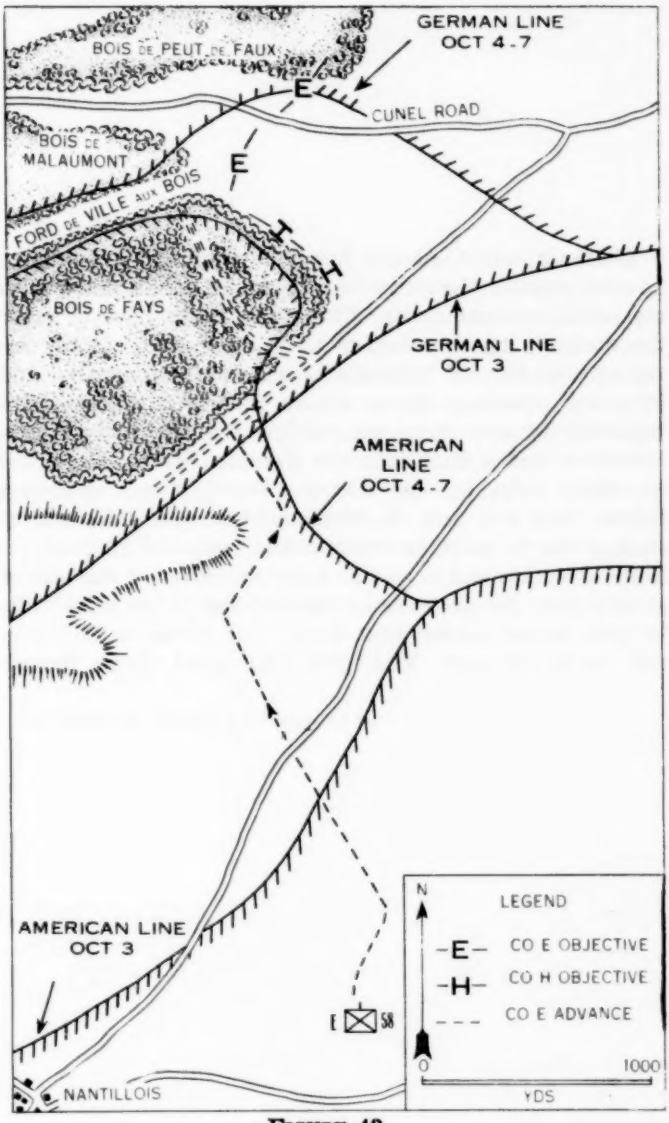

GERMAN LINE
OCT 4-7
BOIS DE PEUT DE FAUX
CUNEL ROAD
BOIS DE
MALAUMONT
FORD DE VILLE AUX BOIS
BOIS DE FAYS
GERMAN LINE
OCT 3
AMERICAN
LINE
OCT 4-7
AMERICAN LINE
OCT 3
NANTILLOIS
LEGEND
CO E OBJECTIVE
CO H OBJECTIVE
CO E ADVANCE
N
0
1000
YDS

FIGURE 43.

While Captain Company E is returning to his company, he contemplates the situation: "I cannot get in touch with my battalion commander. Therefore, I will have to make the decision myself whether to move forward to my assigned objective or temporarily abandon my mission and have my company dig in where it now is. The entire regiment is now in a pear-shaped salient extending a kilometer and a half into the German lines, surrounded on three sides by the enemy. Possibly my company, thrown into the Bois de Malaumont at this time, might change the balance, permitting the regiment to push on to its objective and to so extnd the shoulders of the salient as to relieve the pressure on the division to the left. This, in turn, might permit that division to advance. My men will move forward if I give the word, even though

casualties might be excessive. On the other hand, if I advance, I might be stopped almost immediately, nearly surrounded by the enemy, with nothing to compensate for heavy losses bound to occur. If I throw all my platoons into the action and then am stopped, I will be unprepared to resist counterattacks. If my company digs in where it now is, it will be able to hold, as my men are fresh and willing, and casualties have been few. Possibly the higher commanders anticipated just this situation and therefore attacked in column of battalions in order to push home the attack by a series of successive impulses. Now, it may be my turn to strike the next blow. My mission . . . yes, my mission is to push forward.

REQUIREMENT

Decision of Captain Company E.

SOLUTION

Captain Company E revokes his previous orders nevertheless, and decides to have the 1st Platoon dig in along the edge of the Bois de Fays with its right resting at the northeastern point of the woods. The 2d Platoon is to take a position on left of the 1st, in order to defend the northern edge of the woods.*

*Captain Hull states that he believes his decision not to push on to the Cunel road was erroneous, even though it was backed by the advice of two officers more familiar with the situation than he was at the time.

Within a few minutes Captain Company H arrives and informs Captain Company E that H Company's frontage along the eastern edge of Bois de Fays is of such extent that he has deployed his entire company in line and still a gap of about 500 yards remains between his left and E Company's right. He has no support, and cannot find the battalion commander to report conditions to him. He wants assistance from Company E.

REQUIREMENT

Action of Captain Company E.

SOLUTION

Captain Company E directs the 3d Platoon to report to Captain Company H and to remain under his orders until further notice.

DISCUSSION

Here, two plans were open to Captain Company E. First, he could extend his line to the right and connect up with H Company's left; or, second, he could attach a platoon to Company H and let that platoon operate directly under Captain Company H. Captain Company E believed that the defense of the eastern edge of the woods and that of the northern edge were two distinct problems, and, therefore, the defense of each edge should be under a single commander. In this manner the defense of the entire woods could be better coordinated. Accordingly, Captain Company E chose the second plan, which was later approved by his battalion commander.

CONCLUSION

Company E held the tip of the salient into the German lines for three days and nights. During that period, the Germans shelled the Bois de Fays constantly and made powerful counterattacks against the woods, but the Americans repulsed each attack. On the night of October 6-7 Company E was relieved and returned to Septsarges (about two miles southeast of Nantillois).

Just at daybreak, as the company neared Septsarges an unique but welcome sight greeted them. While the company had been in the Bois de Fays, a direct hit with high-explosive shell had destroyed the company kitchen, killing two cooks. The energetic mess sergeant had learned that a German rolling kitchen had been abandoned as the enemy fell back. He commandeered it, and there it was, steaming with stew.

The following three problems deal with incidents that occurred during recent British operations against tribesmen on the northeast frontier of India.

It must first be understood that in operations of this type all movement, on the march, in the attack, or during withdrawal, should be covered by fire from units in position ready to fire. Therefore we find marching columns, as well as troops at a halt, protected on the flanks by covering detachments posted on commanding ground. Such detachments, even when only a squad, move to and from their positions in at least two echelons. One echelon is always in position to cover by fire the advance or withdrawal of the remainder of the group, even though no enemy is in sight. Thus the time required to post and withdraw covering detachments is greatly increased, but losses and possible disaster from the fire of well-armed tribesmen, waiting in ambush, are avoided.

PROBLEM NO. 3

A sergeant in command of a rifle section at *X* (Figure 44) is charged with posting his section at *B*, in order to protect from there a column moving along the road shown at the left of the figure.

There is no information of the enemy other than that he is in the vicinity, in all probability watching our movements and ready to take advantage of any opportunities that arise.

The sergeant posts his automatic rifles under a noncommissioned officer at *X*, where these weapons can bring covering fire to bear upon both *A* and *B*. The sergeant, with the remainder of his section, advances toward *A*, where he arrives without incident. He halts his party, takes up a firing position under cover, and remains on the alert. There are no signs of the enemy.

The sergeant now considers what he shall do next.

REQUIREMENT

The sergeant's decision.

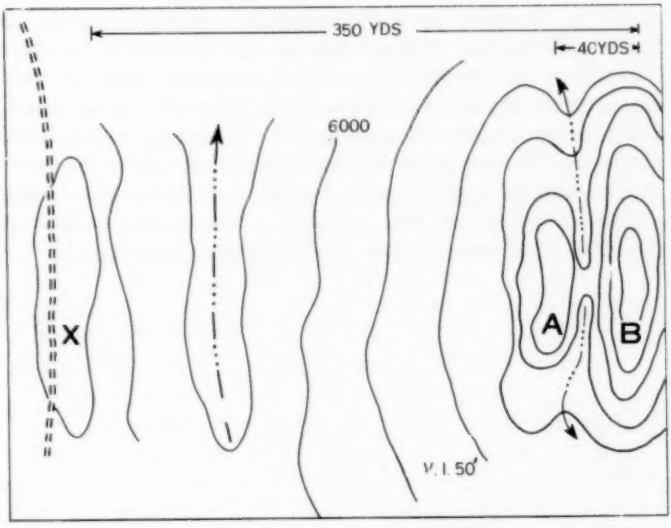


FIGURE 44.

HISTORICAL SOLUTION

The sergeant, confident that the automatic rifles which he had left at *X* were on the alert prepared to give immediate fire support, gave the order for his men at *A* to advance. When the riflemen reached the bottom of the draw between *A* and *B*, the enemy fired a sudden volley at short range from the flank and every member of the sergeant's party was struck. A number of the enemy armed with knives rushed the party from the left and, under the cover of the enemy detachment which had fired the volley, quickly finished off the wounded. The enemy seized all the rifles and ammunition, and quickly disappeared.

FIGURE 45.—Profile of line *X-A-B*.

The automatic riflemen at *X* heard the firing but were unable to help by means of fire because of the defilade that the crest *A* afforded the enemy. (See Figure 45.) The automatic riflemen rushed forward to *A* to find their comrades killed and the enemy gone.

DISCUSSION

The best solution, perhaps, would have been for the sergeant, after he had reached *A* and gone into position there, to signal his automatic rifles forward to *A*. The move on to *B* could have been accomplished by leap-frog-

ging the automatic rifles to *B*, or by posting them at *A* while the riflemen advanced to *B*.

Another way would have been for him to subdivide the section further by sending part of the riflemen to *B*, while the remaining riflemen covered their advance from *A*. This course would have been risky, however, because it involved subdivision into groups too small to hold off the enemy. In this particular situation it appears that the enemy, who was actually able to destroy the entire advance element in so short a time, could have taken toll of the riflemen, had they split into two parties.

Furthermore, since the automatic rifles at *X* could not cover the ravine lying between *A* and *B*, they should have been ordered up to *A* while the riflemen already at *A* were in a position to cover the movement.

Continuous mutual support is extremely important in an operation of this kind. Division of force in the probable presence of the enemy is just as bad for small detachments as it is for an army. In proportion the danger is usually greater. Hence, when maneuver requires a small force to divide under such conditions as those obtaining in this problem, one party must not move beyond covering distance of the other. It was the complete disregard of this simple principle, in fact, that directly resulted in the slaughter of Custer's force at Little Big Horn.

PROBLEM NO. 4

A rifle platoon is advancing across country in search of a band of the enemy believed to be in the vicinity. The presence of the hostile band is not definitely known, but at any rate the enemy can be expected to be watching the movement of the platoon. (See Figure 46.)

When the platoon reaches hill *A* the platoon commander posts a section to cover the further advance of the rest of his unit to the east. As the latter moves forward, the sergeant commanding the section posted at *A* watches the progress of the advancing detachment. When it reached *Y*, about 300 yards to the front, the sergeant began to feel somewhat uncertain as to his next move. He ought to do something, he thought, because the rest of the platoon was leaving him pretty well behind.

REQUIREMENT

The sergeant's decision.

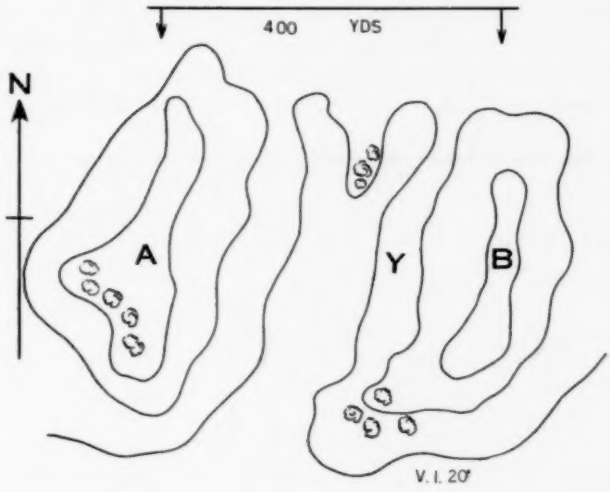


FIGURE 46.

HISTORICAL SOLUTION

The sergeant finally decided that he *was* being left too far behind, and gave the order to advance. Soon the platoon was moving in two echelons across the depression, with the leading group most of the time out of sight of the section in rear. (See Figure 47.) A hurricane of

FIGURE 47.—Profile of line *A-Y-B*.

fire suddenly broke from both flanks. The platoon was wiped out. A rescue party arriving some hours later found only one survivor, who was lying under a heap of dead where he had been overlooked by the savage enemy.

DISCUSSION

The error here is obvious. The rear section should have remained at *A* until the remainder of the platoon reached *B*. For from *A*, it could observe and cover the whole route to *B*. It is the application of the principle of fire and movement that was lacking.

PROBLEM NO. 5

A rifle company (Figure 48) is ordered to hold, during the day, the long wooded ridge *B* against hostile irregulars who are believed to be to the east. The company's mission is that of covering the main body, which is halted at a point off the map to the west.

The company, upon reaching ridge *B*, finds the forward slopes of the ridge bare of vegetation and other cover as far down as *A*. Beyond *A* is a deep ravine, *K*, that offers the enemy an excellent assembly position.

REQUIREMENT

The dispositions of the company.

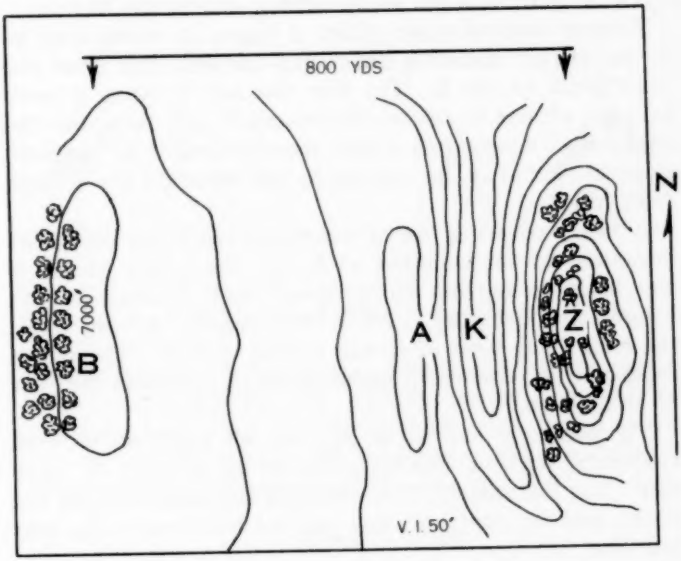


FIGURE 48.

HISTORICAL SOLUTION

The company commander sent a small picket to *A*, where it could overlook the ravine. The remainder of the company was posted along ridge *B*.

There were no signs of the enemy during the day.

Toward evening when picket *A* began its withdrawal to *B*, the enemy opened a heavy and accurate fire from the thick scrub on hill *Z*. The first few men to leave *A* were hit, and efforts to rescue the wounded only increased the casualties. Every time a man showed himself on the open slope in rear of *A*, he was hit by the accurate fire coming from hill *Z*.

A heavy covering fire of automatic rifles and rifles was organized by the company at *B*, but the enemy on hill *Z* was invisible and his fire continued undiminished in both volume and accuracy. As it was rapidly getting dark, the main body west of *B* was unable to help. The picket could not be withdrawn under cover of darkness for fear of an ambush.

The company had to be left out all night on its own resources, without blanket rolls, at an altitude of 7,000 feet. But fortunately, the enemy did not attack during the night, and the company was rescued half-frozen the next morning.

DISCUSSION

The company commander was faced with a perplexing problem. It seemed important for ravine *K* to be watched in order to keep the enemy from using it. There appeared to be no place but ridge *A* from which to do this. However, ridge *A*, and the open slope back to *B*, were devoid of cover and completely dominated by the high ground about *Z*. (Figure 49.) On the other hand the ridge, *B*, had all of the characteristics of a good covering position; namely: cover, an excellent field of fire at long (as well

as short) ranges, observation, a covered route of withdrawal, and good location with reference to the main body. In fact, the crest *B* was a much better position that is generally found. The holding of a position in advance of crest *B* gave still greater security, it is true, to the troops on hill *B*, but added little, if any, to the safety of the main

FIGURE 49.—Profile of line *B-A-K-Z*.

body farther to the west. But this additional security for a covering position already strong was obtainable only by sacrificing the safety of the detachment sent forward. Would it not have been better to be satisfied with the excellent defensive position on crest *B*?

CONCLUSION

In warfare against an enemy possessing patience and cunning no commander who takes liberties with the terrain can expect to succeed for long. An enemy who is always on the alert—especially a native force that knows, in all probability, every inch of the ground—will watch for mistakes to be made, and when one is made, lay a trap from which there is little chance of escape. Sure protection against such disaster only comes from the cultivation and use of an "eye for the terrain" and rigid adherence to the principle of security.

CHAPTER XI

Supply of Motorized Infantry

TENTATIVE ORGANIZATION

No table of organization for the motorized service company has yet been announced by the War Department. The Infantry Board, however, has recently prepared a tentative table (T/O 25W—Special) showing the organization of a partly motorized service company, with the field train motorized and the combat train animal-drawn; and also of a fully motorized service company. This table was used as the basis for the recent recommendations for the revision of TR 420-180 (Service Company in Combat) made necessary by the adoption of motorized transportation.

Table IV shows the principal differences in personnel and transportation of all three types of service company —animal-drawn, partly motorized, and fully motorized:

From Table IV it will be seen that the mixed organization—field trains motorized, combat trains animal-drawn —is not economical in the use of man-power. This service company requires 34 more men than the animal-drawn company. This is caused by the required doubling of maintenance personnel. In addition to wagon-masters, stable sergeant, horseshoers, wheelwrights, and saddlers, this hybrid unit must include truckmasters, dispatchers, and mechanics. With complete motorization, however, a marked economy is effected. Thus, the strength of the fully motorized service company is 27 men less than the animal-drawn, and 61 men less than the partly motorized organization.

TABLE IV

ORGANIZATION OF THE SERVICE COMPANY

1	2	3	4
	Animal-drawn T/O 25 W (1932)	*Partially motorized T/O 25 W special*	*Fully motorized T/O 25 W special*
1. Officers	6	6	6
2. Enlisted men	187	221	160
3. Aggregate	193	227	166
4. Horses	9		
5. Mules, draft	*228	212	
6. Mules, riding	13	7	
7. Kitchens, rolling, 4-mule	18	18	
8. Carts, water, 2-mule (a)	18		
9. Wagons, combat, 4-mule	14	(c) 35	
10. Wagons, escort, R & B	25		
11. Cars, cross-country (or 5-pass. light)	1	2	2
12. Trucks, cargo, ½ or ¾-ton (b)	2	1	1
13. Trucks, cargo, 1½-ton		(d) 26	(e) 85 (f)
14. Motorcycles w/side car		3	3

*Does not include mules for water carts.

(a) or suitable water tank vehicle when developed.
(b) for general utility.
(c) includes 18 wagons carrying water in containers.
(d) includes 21 R&B; 3 repair; 2 gasoline in containers.
(e) includes 18 kitchen trucks; 19 R&B; 15 water in containers; 25 combat (ammunition, etc.); 3 repair; 2 gasoline in containers.
(f) It has been recommended that the rolling reserve of one day of class-I supplies and trucks required for its transportation be eliminated.

In the partly motorized service company, the wagons and trucks are assigned for use as shown in Table V.

Table VI shows the distribution of the motor trucks in the fully motorized service company.

ADVANTAGES OF MOTOR TRANSPORTATION

The War Department is now definitely committed to the employment and development of motor transportation, and the motorization project is now well under way. Many considerations led to this action, but the two main military reasons are: (1) greater speed and radius of operation; and (2) greater maneuverability.

SPEED AND RADIUS OF OPERATION

This advantage needs no discussion for proof. It is merely the application to war of a mechanical growth that has been apparent in social and commercial life for a number of years. The horse and buggy have long since gone: the military mule and wagon are now traveling the same route. The same power that carries a touring family three or four hundred miles with ease in a single day, is now to be used to carry military units similar distances, although, perhaps, not quite so rapidly.

The possible and probable speeds of motorized units are still debatable. On the whole, however, it seems certain that both the fast-minded and slow-minded military motorists are correct. There will doubtless be conditions under which motor columns must creep interminably along, as they generally did in France. But there will often be times, too, when good roads and weather and a cleared highway will permit loaded trucks to sustain speeds of 40 to 45 miles an hour.

All modern 1½-ton trucks can be driven that fast efficiently and safely; and such speeds, in a future war, may sometimes be worth the kingdom that Richard III once offered for a horse. Certainly such a capability for covering ground must be always borne in mind, even if it cannot always be counted on.

TABLE V

ASSIGNMENT OF VEHICLES OF THE PARTLY MOTORIZED SERVICE COMPANY*

Organization	Vehicles and their loads								
	Combat train					Field train			
		Combat wagons				1½-ton trucks			
	Rolling kitchens	Ammunition	Command post equipment	Water in containers	Total wagons	Rations, baggage and forage	Repair trucks	Gas and oil in containers	Total 1½-ton trucks
1st Bn.	5	4	1	5	10	5	.....	.....	5
2d Bn.	5	4	1	5	10	5	.....	.....	5
3d Bn.	5	4	1	5	10	5	.....	.....	5
Regt. Hq. Co.	1	.....	.....	1	1	2	.....	.....	2
Service Co.	1	.....	.....	1	1	3	3	2	8
Howitzer Co.	1	2	.....	1	3	1	.....	.....	1
Total Regt.	18	14	3	18	35	21	3	2	26

*Exclusive of company train vehicles—2 cross-country cars, 1, ½- or ¾-ton truck and 3 motorcycles.

TABLE VI

THE FULLY MOTORIZED SERVICE COMPANY*

Organization	1½-ton trucks and their loads									
	Combat train					Field train				
	Ammunition	Command post equipment and rolls	Water in Containers	Kitchens	Total in combat train	Ration and baggage	Gas and oil in containers	Repair	Total in field train	Total combat and field train
1st Bn.	3*a*	3	5	5	16*a*	5	.....	.....	5	21*a*
2d Bn.	3*a*	3	5	5	16*a*	5	.....	.....	5	21*a*
3d Bn.	3*a*	3	5	5	16*a*	5	.....	.....	5	21*a*
Regtl. Hq Co.	.....	4	1	1	6	2	.....	.....	2	8
Ser. Co.	.....	.....	1	1	2	1	2	3	6	8
How. Co.	3	.....	1	1	5	1	.....	.....	1	6
Total in Regt.	12*b*	13	18	18	61*b*	19	2	3	24	85*b*

*Exclusive of vehicles of company train—2 cross-country cars, 1, ½- or ¾-ton truck and 3 motorcycles.
a. One more truck is added if machine-gun company is not motorized.
b. Three more trucks are added if machine-gun companies are not motorized.

In Reference Data, the speed of light truck trains appears as 14 miles per hour in daylight and 12 at night. These moderate figures doubtless make allowances for the poor conditions and the delays that often obtain in war. And it may, for the present, be well to hold ourselves down to these rates in map problems and other studies, and also to limit the day's motorized march to 140 miles as in Reference Data. But we should nevertheless remember that under favorable conditions much more is possible without risk or strain.

In November, 1934, eight standard 1½-ton trucks and one heavy repair truck of the 29th Infantry made a 353-mile journey at an average speed of slightly over 33 miles per hour. This trip was made through the normal traffic of cities, towns, and countryside. Travelling about 100 yards apart these trucks, at 33 miles an hour, passed any given point in 54 seconds. This is a rate of 10 to the minute, and 600 to the hour, on a single road. At least one good parallel road existed for this journey, and a third good road between the two points, but 75 miles longer, existed. Thus 1800 trucks an hour, carrying roughly five infantry regiments, or 2700 tons of supplies, could have passed along those roads.

Once we have available for maneuvers a division or even a brigade of wholly motorized units, we shall be able to tell more surely the real value of speed and wide radius of operation. Larger units by far than the small 29th Infantry convoy mentioned above have already demonstrated what we may expect. But the true aspects of motorization, both in tactics and supply, will not be definitely shown until a division actually employs simultaneously a thousand or more trucks in the field.

As brought out in Chapter IV, Volume VIII, of the Mailing List, the efficiency with which we realize the speed capability of the modern motor depends not so much on the road run itself, but on the regulation of traffic. Getting started, keeping roads clear (for one-way traffic when possible), and distributing traffic after the run, are all important, and need the careful,

practical, study that only experimenting with large numbers of trucks can give.

MANEUVERABILITY

"The motor will never supplant the mule in war because there are so many places where the mule can go that the motor cannot possibly go." How often this statement has been made! And how false it has been shown to be! The experiences of the 29th Infantry at Fort Benning and the mechanized force at Fort Knox, not to mention those of thousands of commercial contractors, prove conclusively that there are astonishingly few places where the motor cannot go. The modern, powerful light truck with large, low-pressure tires can successfully traverse deep sand, mud, and even swampy ground. The motorized machine-gun company and howitzer platoon of the 29th Infantry employ their tactical vehicles constantly on all field exercises and maneuvers, both by day and by night, over all kinds of poor roads, and across country over rough terrain as well. Nearly two years ago, in fact, the Infantry Board stated in a report that the commercial 1½-ton truck *can* go wherever the escort wagon can.

SUPPLY PRINCIPLES

Although the tactical aspects of motorization are somewhat more vivid, its effect upon supply is fully as important. The highways of the United States bear daily several millions of trucks, all engaged in carrying supplies from source to sale. And in any future war, even far more than in the last one, supplies will move steadily forward from rear to front in sturdy, speedy, economical trucks.

This does not mean, of course, that the recognized principles of supply must undergo a change. The fighting soldier, with his belly full of warm food, his equipment in good shape, and plenty of ammunition available, is still

the goal of supply. It makes no difference whether that soldier rides in a tank or in a truck, or plods weary miles on foot. His wants are much the same, and wars cannot go on unless they are met.

The five fundamental principles that govern the supply of infantry units in campaign are worth restating here, so that we can clearly see that they hold, whether we use motors or mules:

(1) Organization for supply must be flexible, mobile, and simple, in other words, capable of adjusting itself to rapidly changing situations.

(2) Supplies must be echeloned in depth.

(3) Combat troops must not be loaded down with unnecessary supplies.

(4) Combat troops must be continually furnished with the proper kinds and quantities of supplies.

(5) The "impetus" of supply should come from the rear.

Motors, as we shall see, change none of these. Instead, their substitution for slower and less efficient carriers only emphasizes the correctness of these principles, and makes it possible to approach their realization much more closely than before.

SUPPLY METHODS

Let us now consider in detail, the specific changes that motors bring about in supply methods. We can do this best perhaps under the two headings we have heretofore employed, partial motorization, and complete motorization.*

---

*Until official tables of organization are announced and standard types of equipment are adopted, the changes indicated herein must be accepted as tentative.

PARTIAL MOTORIZATION (FIELD TRAINS ONLY)

DISTRIBUTION

The main functions of a regimental field train are to obtain daily food and fuel from the next higher supply echelon, usually the Division Quartermaster, and distribute them to the companies of the regiment. In addition the field train carries the regimental baggage, and a rolling reserve of food and fuel for one day.

There are, of course, two possible ways in which the field train of a regiment can get its daily loads of essential, class-I supplies. It can go to the railhead after them, or it can wait for them to be delivered to a suitable point.

Heretofore, the second method, called "unit distribution" has always proved best. Trucks of the Division Quartermaster Regiment go to the railhead, load supplies in regimental lots, and take them directly to the regimental distributing points, usually located in field train bivouacs. Here, they are unloaded, resorted into company loads, and sent forward in field train wagons.

Unit distribution as just outlined has been the most practical and efficient system up to the present for two reasons. It made the utmost use of the division motor transportation; and held the work of mules and wagons down to what they could actually accomplish. For it is ordinarily out of the question to expect animal-drawn supply units to go after their loads, several miles back to the railhead, and bring them forward, this in addition to distribution within the regiment, which alone is often a strain under combat conditions, and not infrequently impossible of accomplishment.

But with the field trains themselves motorized, an additional run of 10 or 15 miles means little more in the

day's work. And thus it is apparent that "railhead distribution" to regimental field train trucks should be the normal procedure. This not only decentralizes the task of distributing supplies, but, furthermore, releases the division motor transportation for other uses.

This will only be true, however, if the ration section is continued as a part of the field train. If on the contrary the ration section is eliminated from the motorized field train, leaving only the maintenance section, the Division Quartermaster will have to continue unit distribution, but make that distribution direct to kitchen bivouac rather than to field train bivouac.

BIVOUAC LOCATION

Whether the motorized field train hauls rations or not, it will have much greater latitude in establishing its bivouac. Heretofore field trains have located their bivouacs just far enough back to be out of range of hostile artillery. This made the length of wagon haul forward to the kitchens as short as possible consistent with safety for the bivouac. But for motors, here again, distance is an element of no great importance, and bivouacs will ordinarily be placed much farther to the rear.

ROLLING RESERVE

The rolling reserve of one day's class-I supplies (food, forage, and fuel) with which the animal-drawn field train has been burdened has been in the nature of a stop-gap. With slow-moving wagons forming a link in the chain, the daily procurement and distribution of rations frequently could not be accomplished in time to prepare and serve meals to the troops during hours of darkness. The rolling reserve has been necessary to meet such emergencies. But the motorization of field trains will, in all probability, permit the elimination of this constant extra cargo of about 10 tons. Still more important is the elimination of the frequent necessity of dumping this 10-ton

load at the field train bivouac in order to release the vehicles for routine tasks. From every aspect, in fact, doing away with the rolling reserve effects a considerable saving of time and labor.

CLASS-I SUPPLIES

In the actual handling of class-I supplies, motorization of the field train should cause very little change. The regimental class-I distributing point may be farther to the rear than before, but the locations of day bivouacs for the kitchen sections of combat trains and the night kitchen locations would not be affected except when the terrain is so broken, swampy, or heavily wooded that cross-country travel for vehicles is impossible. When this is the case, both the day bivouacs and the night kitchen locations must be on or near roads and so accessible to the trucks.

The decrease in the number of animals and the increase in the number of motor vehicles indicate proportionate changes in the amounts of forage and fuel. Even if the 10-ton rolling reserve mentioned above is continued, there appears no reason for carrying a reserve of gasoline and oil greater than one refill for each vehicle, because the field train bivouac will be farther to the rear where fuel supplies are easily obtainable.

AMMUNITION

Inasmuch as the field train has no routine function in the chain of ammunition supply, motorization of only the field train does not, in theory at least, affect this important aspect of supply. But in practice, it will be unusual if trucks are not often detached from the field train to augment the work of ammunition wagons. This is likely to occur in any emergency, and would be a commansense, time- and labor-saving expedient. The assistance of available motors would be needed most, perhaps, be-

tween the division or brigade distributing point and the battalion distributing points, especially when the former is relatively far to the rear.

FULL MOTORIZATION

CLASS-I SUPPLIES AND METHODS OF FEEDING

The above remarks, relative to the location of the field train bivouac and the regimental class-I distributing point, and the prospective abolition of rolling reserves of class-I supplies, are likewise pertinent to the fully motorized organization. In addition, motorized kitchen equipment will undoubtedly necessitate several changes in the method of feeding troops. The type of kitchen equipment that will ultimately be decided upon is, of course, problematical. It may be a truck with a built-in, permanently installed cooking apparatus; a kitchen trailer, so constructed that it can be attached to a truck; a portable, compact gasoline or oil-burning cooker using a motor truck only for transportation; or, most likely of all, it may be simply the present field-range carried on a truck, and placed on the ground for use. Whatever type of motorized kitchen equipment is adopted, considerations of safety, control, and economy of operation indicate that the kitchen sections will be a part of the field train and that they will habitually take station in the field train bivouac, where all meals will be prepared. From this location, hot food will be transported in containers by truck to the troops in the line.

If, in some unusual situation, it is impossible or impracticable to bivouac the kitchens with the field train, regimental, battalion, or special unit kitchen bivouacs may be established. Even in this case, kitchen bivouacs will be relatively farther to the rear than is the practice in

establishing day locations with animal-drawn units. In any event, it is highly improbable that the kitchens themselves will go to what we now call the night locations, immediately in rear of the troops.

AMMUNITION

The use of motors for ammunition supply will not only permit all distributing points to be farther to the rear, but will also greatly expedite the delivery of ammunition to the troops. Thus shortages can be overcome and expenditures replaced much more quickly. This is particularly so in the attack, when ammunition vehicles operate in daylight.

It is here in the role of ammunition carriers that small, fast, track-laying vehicles would be of maximum usefulness. With "chenillettes" or similar vehicles, in practically every situation, ammunition could be delivered on, or close to, the front line, thus eliminating the necessity of carrying parties, again saving both time and man power. It is, however, in the forward areas mainly that such vehicles are designed to operate. They should not be expected to make the long haul from the division or brigade ammunition distributing point. Rather, they will operate between the battalion distributing point and the troops in the line, leaving to the ammunition trucks the transportation of ammunition from the division or brigade distributing point to the battalion distributing points.

HEADQUARTERS AND MEDICAL SECTIONS

Motor transport is a great advantage to these sections, it is hardly necessary to state. With the combat train motorized command posts and aid stations can be moved with many times the former rapidity. And the cross-country ability of the 1½-ton truck will usually make it possible to set up these establishments well away from roads and other dangerous areas.

CONCLUSION

Even a cursory study of this subject shows that there is still a great deal of planning and research to be accomplished before the maximum benefits and advantages of motorization within the infantry regiment are attained. Many questions are still unanswered. Manifestly the employment of motor transportation by the simple process of substituting one, 1½-ton truck for each escort wagon in the animal-drawn organization is uneconomical and impractical. Such a plan disregards the principal reason for motorization, and fails to take advantage of the evident capabilities of the motor vehicles.

The cargo capacity of the proposed motorized service company (T/O 25W Special) is apparently far in excess of the actual needs of the regiment. Complete motorization of company trains will also doubtless have the effect of reducing the cargo capacity now necessary in the service company. In fact, it is quite probable that ultimately motor transportation within the infantry regiment will be operated on the pool principle, with vehicles on call as needed for any purpose, and without the sharp distinctions between field and combat trains that characterize our present organization.

However, we are not particularly concerned here with nomenclature, types of equipment, and similar details, but rather with a study of modern, efficient means and how we are best to use them in order to expedite and facilitate the supply of the regiment. The principles of supply are, as we have seen, the same as ever. Our job is to get the most we can out of the army motor, just as we have for several centuries out of the army mule.

CHAPTER XII

Supply Problem—Motorized Infantry

FIRST SITUATION

On September 25th the Blue 1st Brigade, reinforced, was advancing eastward with the mission of protecting the right flank of the I Corps. During the afternoon of that day the brigade encountered the leading elements of a superior hostile force generally along the line Silver Run—Pleasant Grove School. Now, at 7:00 PM, it is defending in the position shown in Figure 50 (fold-out at end of this chapter). The brigade commander has been ordered to hold this position until the arrival—probably late in the afternoon of September 27th—of Blue reinforcements.

The railhead is Emmitsburg; and the daily train with one day's class-I supplies for the brigade, including an A-ration, arrives at 9:00 PM. Railhead distribution will be made on the following schedule: 2d Infantry, 9:00 PM; 1st Infantry, 9:30 PM; 1st Field Artillery, 10:00 PM; 1st Battalion 3d Field Artillery, 10:30 PM.

Forty tons of infantry ammunition will be available to the 2d Infantry at Taneytown at 8:00 PM.

Service Company, 2d Infantry, is partially motorized (field train motorized, combat trains animal-drawn), corresponding to column 3 of the Table IV on page 200 and Table V page 202.

Supply is normal, and the field train, 2d Infantry, is awaiting orders at Emmitsburg. The kitchen sections of the combat train, 2d Infantry, are in bivouac near Mark-

er's Mill, about three miles southwest of the defensive position. The kitchens have on them one meal, supper, which will be ready in about 30 minutes. The ammunition sections of the combat train, fully loaded, are with the kitchen sections.

FIRST REQUIREMENT

a. The location of the field train bivouac.

b. The plan of S-4, 2d Infantry, for the supply of ammunition for the defense.

c. The plan of S-4, 2d Infantry, for feeding the troops to include lunch, 26 September.

A SOLUTION OF FIRST REQUIREMENT

a. Field train bivouac: Emmitsburg.

b. Plan of S-4, 2d Infantry, for ammunition supply:

(1) To have the ammunition sections of the combat trains move forward at once to the position, dump their loads, and return to their bivouac near Marker's Mill.

(2) To have 12 trucks of the field train drop their loads at once in their bivouac at Emmitsburg, proceed immediately to Taneytown, load 18 tons of ammunition at the ammunition refilling point, and place that upon the position; then to return to the ammunition refilling point, load an additional 18 tons of ammunition, and deliver that to the ammunition sections of the combat train in their bivouac near Marker's Mill; then to return to bivouac at Emmitsburg.

(3) To arrange through battalion S-4's to have company guides meet these trucks at CR *A* (about a mile in rear of defensive position) and conduct them to their respective company areas.

c. Plan of S-4, 2d Infantry, for feeding the troops:

(1) To have the kitchen sections of the combat trains move forward at once and feed supper on the position.

(2) To have eight trucks of the field train drop their loads at once in their bivouac at Emmitsburg, receive class-I supplies at the railhead at 9:00 PM, deliver the A-ration to the kitchens in their night locations, and return to their bivouac at Emmitsburg.

(3) To have the kitchens feed a hot breakfast and issue a cold lunch in the night locations and return to their bivouac near Marker's Mill by 5:10 AM, 26 September.

SECOND SITUATION

The situation is exactly the same as that given in the first three paragraphs of this chapter. In this situation, however, Service Company, 2d Infantry, is fully motorized. (See column 4, Table IV, page 200, and Table VI, page 203)

Supply is normal and the field train, 2d Infantry, is awaiting orders at Emmitsburg. The kitchen sections of the combat train (field ranges carried on standard 1½-ton trucks) are in bivouac in the vicinity of RJ *B* (1200 yards northeast of Taneytown). The kitchens have been set up and the one meal remaining—supper—will be ready by 7:30 PM. The ammunition sections of the combat train, fully loaded, are with the kitchens.

Lights on motor vehicles will be permitted west of Taneytown only.

SECOND REQUIREMENT

a. The plan of S-4, 2d Infantry, for the supply of ammunition for the defense.

b. The plan of S-4, 2d Infantry, for feeding the troops to include lunch, 26 September.

A SOLUTION OF THE SECOND REQUIREMENT

a. The plan of S-4, 2d Infantry, for ammunition supply: To have the ammunition sections of the combat train proceed at once to the position, dump their loads, and return to the ammunition refilling point (Taneytown), secure an additional load, and place that on the position; then to return again to the ammunition refilling point, refill, and proceed to bivouac in the vicinity of RJ *B*.

b. The plan of S-4, 2d Infantry, for feeding the troops to include lunch, 26 September:

(1) As soon as supper is prepared to have kitchen trucks deliver the hot food in containers, and water in containers, to the troops on the position. To have the kitchen trucks return to the bivouac of the kitchens as soon as containers have been emptied.

(2) To have eight trucks of the field train receive the class-I supplies at the railhead at 9:00 PM, deliver the A-ration to the kitchen bivouac as soon as loaded, and then return to field train bivouac at Emmitsburg.

(3) To have the kitchens prepare breakfast and cold lunches in sufficient time to have the food ready at 2:00 AM, 26 September. To have the kitchen trucks deliver breakfast and lunch, and water in containers, to the troops on the position, and return to the kitchen bivouac by 5:10 AM.

DISCUSSION

This problem illustrates the principal differences in supply methods between animal-drawn and motorized service companies, and also those differences between partly motorized and wholly motorized service companies.

The employment of motor transportation permits locating railheads, ammunition distributing points, and bivouacs considerably farther to the rear than is the practice with animal-drawn trains. In large commands, as a matter of fact, the railhead is located sometimes 50 miles

or more in rear of the line. In this problem, with an independent reinforced brigade, the railhead was located about 18 or 20 miles to the rear, which is not at all unusual in such situations. In lieu of the conventional brigade ammunition distributing point we find in this problem a refilling point—probably established by corps—somewhat farther to the rear than is usually the case when the regimental trains have no motor components. In both situations in this problem we find the field train, motorized, in Emmitsburg awaiting orders. There seems to be no good reason why the field train should be bivouacked farther to the front than this point, where ample facilities exist for shelter and where hard standings and turn-arounds for vehicles are plentiful. If the brigade or higher authority for any reason had restricted Emmitsburg for such use, Saint Joseph's Academy, one mile to the south, would have provided an ideal location.

That part of the solution of the First Requirement which contemplates the use of field-train trucks to haul ammunition from the ammunition refilling point to the position and again to replenish the ammunition sections in bivouac is an illustration of the "pool" idea of operation. There are, in the ration and baggage section of the field train, in the table of organization with which we are concerned in this phase of the problem, 21 trucks, eight of which are ample to haul the class-I supplies for the regiment. There being no other immediate task for the remaining vehicles, it appears to be only a commonsense matter to employ them for the transportation of ammunition. From the ammunition refilling point to the center of the position of the 2d Infantry is just 10 miles. But it is a physical impossibility for the animal-drawn vehicles of the ammunition sections to place two loads on the position and retire to bivouac, fully loaded, during the hours of darkness. With the solution adopted, however, the entire task is accomplished and the field train trucks are back in bivouac by about 1:00 AM. This allows 30 minutes for the trucks to dump their loads in the

field train bivouac and 30 minutes for each loading and unloading of ammunition, which is ample.

The problem of ammunition supply in the Second Situation presents no difficulties. The motorized ammunition sections are in bivouac, fully loaded, and near the ammunition refilling point; and they can easily place two loads on the position and retire, loaded, to bivouac by 1:30 AM. Again the superiority of motor transportation in the saving of time and labor is demonstrated.

The solution with respect to the feeding of troops in the First Situation is perhaps the only feasible one, and the method used does not differ materially in principle from that employed when the field train is animal-drawn. Examination of the defensive position of the 2d Infantry shows an excellent net-work of roads, indicating that the trucks carrying the new A-ration will experience little if any difficulty in reaching the night locations of the kitchens. Assuming, for example, that the regiment has employed two battalions in the forward position, and each of these battalions, two rifle companies with attached machine guns and howitzer weapons, we may well expect to find the night locations of the kitchens of the four forward companies approximately as follows, from right to left:

(1) In the vicinity of CR *C*.

(2) In the covered draw about 400 yards southeast of road bend *D*.

(3) In the vicinity of RJ *E*.

(4) In the vicinity of Pleasant Grove School.

Three of these locations are on or immediately adjacent to a road, and the fourth necessitates a cross-country haul of only some 400 yards. Under the solution indicated, the new A-ration will reach the night location of the kitchens about 11:15 PM, which leaves ample time for the preparation and serving of breakfast.

In the Second Situation, S-4 was faced with the problem of whether to use field train vehicles to deliver the new ration to the kitchens, or require the kitchen trucks them-

selves to secure the ration at the railhead. As a matter of fact, if, with the advent of complete motorization, the field train should be eliminated except for a baggage section, the kitchen trucks will be required to take over the procurement and transportation of rations as a matter of routine. In the present situation, however, field train trucks were available for this task and were employed in order to expedite delivery and save the kitchen trucks the 18-mile round trip from the kitchen bivouac to the railhead.

CHAPTER XIII

Operations of the 3d Platoon Company A, 301st Tank Battalion September 26-29, 1918

BY

CAPTAIN JOSEPH J. GUTKOWSKI, INFANTRY

Tanks had demonstrated their worth as an offensive weapon some time before the United States entered the World War, and it was essential that our army be provided with this weapon to aid the infantryman in breaking through the hostile lines. But to equip the United States Army with tanks was somewhat of a problem. For although our nation was most advanced in automotive engineering, it found itself lacking in material that could be easily converted into tanks in a short period of time. In fact it took almost two years before America was prepared to construct tanks in quantity, and this was only possible with the aid of her Allies. Hence it was necessary to accept anything our Allies had to offer in forming a nucleus for the United States Tank Corps in France and America.

The mission of recruiting and organizing the United States Tank Corps in America was given to Colonel Harley B. Ferguson, C. E., U. S. A., a capable and worthy officer of the pre-World War days, who had distinguished himself in the Spanish-American War, and by raising the battleship *Maine*, fourteen years after its sad ending. Colonel Ferguson selected a number of commissioned and noncommissioned officers for the framework of this new

arm. And late in February, 1918, under the designation 65th Engineers, the organization that was to become the 301st Battalion, U. S. Tank Corps, was assembled at Camp Meade, Maryland.

On April 9, 1918, this battalion reached the British Tank School at Wareham, Dorset County, England, where it was trained in tank technique and tactics. It remained at Wareham until August 24, 1918, then moved to France and was attached to the British Tank Corps for a tour of service at the front.

The battalion was to be trained and equipped by the British and remain with them as part of the British Tank Corps until American tanks became available. It was then to return to the American Army.

After the battalion's arrival in France, the first two weeks were spent in drawing equipment and tanks. On August 30th a detachment of officers and noncommissioned officers left the battalion to join the British Tank Battalions which were to support the Canadian Corps east of Arras. They went for the sole purpose of observing tanks in action, which was indeed of great value to the inexperienced Americans.

On September 4, all British Tank Battalions were withdrawn from armies and placed in G.H.Q. reserves for refitting and reorganizing. And with this change, the 301st Tank Battalion found itself a part of the 4th British Tank Brigade, and was informed that its first assignment would be to lead the 27th American Division of the II American Corps in its assault on the Hindenburg line on September 29, 1918.

PLAN OF ACTION

The II American Corps, attached to the Australian Corps, was to resume the offensive on the morning of September 29 in a general northeasterly direction from its present front line and was to attack with both divisions abreast, the 30th Division on the right and the 27th Division on the left. (See Figure 51, fold-out at the end

of this chapter.) After breaking and taking the Hindenburg line, the Corps was to push on to capture the first objective which included Nauroy and Gouy. When this objective was taken, the 3d and 5th Australian divisions were to pass through the 27th and 30th American Divisions, respectively, and continue the attack.

On the left of the II American Corps, was the III British Corps, which was to advance with the 27th American Division as far as the canal. After the capture of its first objective, the 27th Division was to exploit to the left with one regiment (105th Infantry), assisting the III British Corps to cross the canal.

Headquarters 4th British Tank Brigade allotted the 301st Tank Battalion to the 27th American Division, Company A being assigned to the support of the 108th Infantry. This monograph deals with the 3d Platoon (5 tanks) of Company A.

At a conference on the morning of September 19, the commanding general, 4th Tank Brigade informed the battalion and company commanders of the 301st Tank Battalion of the general plan of the attack. On September 25, the battalion commander in conference with the commanding general 27th Division learned that the division commander had very little faith in tanks and was reluctant to have them precede his troops in battle. He was afraid that if the tanks got blown up, it would have a bad moral effect on his infantry. But after a second conference at Headquarters 27th Division, the division commander did permit the tank officers to contact the infantry regimental and battalion commanders with whom they were to work. But, "no time was available for any training with the infantry so that both tanks and infantry went into action with only theoretical knowledge of what to expect of each other, and without that fundamental feeling of respect and confidence in each other's ability so necessary for perfect teamwork."*

*Personal experience monograph—Major Roger Harrison —Infantry.

Another essential prerequisite was omitted in the preparation for this attack. Individual tank commanders were given no opportunity to observe the ground over which each was to operate. The battalion and company reconnaissance officers, however, made a very thorough and complete reconnaissance of the forward area, and each tank commander was given three maps to take into action with him. These maps showed his route and objective; all known and probable obstacles, such as sunken roads and wide trenches; the location of land marks to help him keep oriented; and an abbreviated barrage table for his particular area. In addition to these maps, each tank commander carried oblique air photographs of the area he was to cover.

Routes to the front line were to be taped by the company reconnaissance officer but every man in the detail he sent out was either killed or wounded by a shell while laying the tape. So this route was not completed, and instead the tanks were led to the "jump-off line" by members of the reconnaissance staff.

APPROACH MARCH

The battalion was approximately eleven miles from the front line at the time it received its orders to move forward and join the 27th Division.

For secrecy, all movements were made under cover of darkness; and on the night of 27-28 September the tanks were moved forward about six miles to the vicinity of Villers Faucon (1½ miles west of Ronnsoy). All tanks completed the move on schedule and without difficulty, and were camouflaged before daylight. They were given final adjustments at this place and were completely filled with gas, oil, and grease, and received, in addition, a one-half fill to be used just before reaching the line of departure, or as the British say the "start line".

In contrast to the first night the march during the following night from Villers Faucon to the start line (about

five miles) was made under the most trying and difficult conditions. The enemy shelled the route so constantly with high explosive and gas that gas masks had to be worn. This, of course, made it all the harder to handle the tanks in the dark. However, all five tanks pushed steadily forward throughout the night, reaching and actually crossing the start line at H-hour.

Noise planes from the 8th Squadron, Royal Air Force, covered the last stages of the approach march. Because of the distinctive noise made by tank motors, it was necessary to find some means of preventing the approach of tanks becoming known. Without something to drown out their noise the enemy would know long beforehand that a tank attack was imminent. "Experience had proven that this could best be done by low-flying planes since the noise of their motors was quite similar to that of the tanks and at that stage of the war the presence of low-flying planes was no novelty."*

WEATHER AND GROUND CONDITIONS

At 5:50 (H-hour) on the morning of September 29, a slight mist hung in all the valleys in the area of operations and made visibility, especially from a tank, almost nil. However, this cleared by 7:00 AM and for about an hour it remained fair. The wind that dispelled the mist was at first very much in the platoon's favor, in that it carried the smoke (composing 40 per cent of the barrage) toward the enemy. But about 8:00 AM mist and haze again blanketed the area, and about 10:30 AM the wind changed its course and blew toward our troops, making visibility as poor as it had been at H-hour. We could not even see our own infantry, much less the enemy.

*Personal experience monograph—Major Roger Harrison —Infantry.

Cooperation or concerted action of any kind was impossible.

Ground conditions, however, were excellent and offered no serious difficulties for tanks. Although the Hindenburg line was expected to be a serious obstacle, the tanks that succeeded eventually in reaching it, crossed without difficulty, and kept on going.

THE OPERATIONS

Before the attack could take place it was considered essential that the high ground along the general line: Quennemont Farm—Guillemont Farm—The Knoll, be captured, and the entire battle, in fact, was planned on the premise that this line would be in our hands before September 29th. This line was also the proposed line of departure. And two hundred yards in front of it was the artillery barrage start line.

The III British Corps had made several efforts to capture this line and actually reached it several times. But every time, however, they were unable to hold it in face of the enemy counterattacks. As a result, the front line, when taken over by the 27th American Division, varied from 400 to 1000 yards in rear of the line of departure proposed for the attack on September 29th. Again on September 27, the 106th United States Infantry made a gallant and determined effort to reach and hold the line, but though small parties reached their objectives, their efforts fared little better than those of the III British Corps before them, and the front line remained approximately as it is shown on the map.

To reach the proposed line of departure at H-hour, the infantry had been ordered to start its assault at H-minus-one-hour and work its way up to the designated line of departure. As some resistance was expected, the tanks were to cross the present front line at H-minus-one-hour and assist the infantry in reaching the start line.

Upon arrival near the front line the platoon commander 3d Platoon, Company A, 301st Tank Battalion found the unit commanders with which his platoon was to operate and told them that the platoon was deployed and would cross the present front line at H-minus-one-hour ready to support the advance of their units. This was in accordance with the very definite instructions he had received from his company commander and had communicated to his tank commanders on the night of September 28th. To his consternation, he was told that the infantry would leave their present position at H-hour. This change of plan would place the infantry from 600 to 800 yards in rear of its protective artillery barrage, instead of 200 yards behind it.

On receiving this news the tank platoon commander was in a predicament. He must change his own plan and adopt one that would best assist the infantry and still conform to his orders. Three plans appeared practicable.

First: He could start as originally planned; that is: cross the present front line at H-minus-one-hour; and then let the infantry catch up, *after* the tanks had passed the designated line of departure at H-hour. This would leave a gap of approximately 500 yards between the tanks and infantry, but would give the tanks the benefit of the barrage to be laid down 200 yards in front of the line of departure.

Second: He could start from the present infantry line at H-minus-one-hour and cause all the damage possible to any enemy encountered near or on the line of departure. thus easing the infantry's progress to that line; and then wait for the infantry there. The disadvantage of this plan was that the platoon would probably lose the benefit of the artillery barrage. On the other hand, the tanks could maintain contact with the infantry, which would enhance the opportunities for continuous support.

Third: He could disregard his orders, join the infantry in their present position, and start with them at H-hour, 600 to 800 yards behind the protective barrage.

He chose the second plan; and instructed his tank commanders accordingly. And at H-minus-one-hour the tanks moved out. As they advanced each tank crew made every effort to keep contact with the infantry and assist them forward by clearing wire entanglements and destroying machine-gun nests. But actually they rendered little support, for the individual tanks fared very poorly. Tank number 1, in the center, developed mechanical trouble soon after crossing the line of departure. Tank number 3, in clearing wire entanglements, ran into a mine field and was destroyed. Tank number 2 on the right got into the line of direct artillery fire and was destroyed. Tanks numbers 4 and 5 were more successful. They passed the Hindenburg line and reached the tunneled canal, but were of little assistance to the infantry, so far ahead of it did they get.

But if all of the tanks had been able to penetrate for some distance, they would still, in all probability, have accomplished little. For visibility was extremely poor. As the tank commanders all said later in their reports, nothing could be seen at even short distances. Not only the heavy mist but the dense smoke made it impossible, during the greater part of the operation, to orient themselves. Gunners could not use their guns effectively, for targets a hundred yards away, and at times even closer, could not be seen at all.

GERMAN ANTITANK DEFENSE

The difficulties of operation were increased, moreover, because of the effectiveness of the German antitank defense. The Germans had learned that tanks can operate only over favorable terrain, such as the zone of the 27th Division presented. Here the St. Quentin canal ran underground through a tunnel and did not present the impassable obstacle to tanks that it did to the immediate west. The Germans, aware of this condition, were well prepared to resist a tank attack on this portion of the front. The

defenses that we met during the attack are considered below in the order of their effectiveness.

FIELD AND ANTITANK GUNS

These weapons fired at our tanks by direct laying over open sights. Although they put only one of the five tanks in the platoon out of action, they destroyed, by direct hits, sixteen of the thirty-four tanks of the battalion, which took part in this action. Though this is an exceedingly heavy loss, it would, as Major Harrison says in his account, "no doubt have been greater had not smoke blanketed the entire field".

TANK MINES

The tank mines encountered had been planted by the British prior to their withdrawal in the spring of 1918; but they were well preserved by the enemy. No knowledge of these mines was given us by the British. As a result, one tank of the platoon was needlessly lost, when it ran over one of them.

ANTITANK RIFLES

A number of these rifles were found on the battlefield, but apparently the German soldier had no liking for their heavy recoil. The bullet from these rifles would easily penetrate a tank. The platoon suffered no casualties, however, from these weapons.

TRENCHES AND SUNKEN ROADS

Although within the battalion nine tanks were ditched in various trenches and sunken roads, our platoon lost none in this manner.

All of these causes together took a heavy toll from the tank personnel, as well as tanks, throughout the bat-

talion. Our platoon, which fared better than some, lost about forty per cent of its officers and men.

COMMENTS

Both from the tank and the foot troops point of view the attack was a failure. On the right of the 108th Infantry zone of attack (our zone), the line, at the end of the attack, had been carried forward by the success of the 30th American Division. But it bent sharply back to the left across the 108th Infantry's zone where it rested on what was to have been the line of departure that morning. The "infantry had made some advance but the tanks had accomplised nothing to compensate for the loss of their machines and personnel."

Many factors contributed to the failure of this attack but the primary cause was the lack of coordination. This was due to designating a line of departure from 400 to 1,000 yards in front of the actual front line—a line of departure that was, in fact, held at H-hour by the Germans. The movement to the proposed line of departure developed of necessity into a major operation which disrupted the entire attack on this part of the front.

Another factor contributing to failure was the lack of cooperation between the different arms. The artillery barrage was laid down initially 200 yards in front of the line of departure with the result that the infantry units were left far behind this protective barrage and received practically no benefit from it. The reason for so placing this barrage is understood to be that many of our own men, wounded in the action of September 27, were still lying out in no-man's land. Again, there was little cooperation between tanks and infantry, owing in great measure to poor visibility, but primarily because the tanks crossed the actual front line at H-minus-one-hour as ordered, whereas the troops moved out one hour later.

But even if the tanks and infantry had moved to the attack together, cooperation would have been difficult be-

cause there was no opportunity prior to the attack for combined training. Without this training the tank-infantry team could not work in unison.

As stated previously, the Germans were well prepared for a tank attack in this area; therefore the degree of surprise attained was small indeed. The prolonged bombardment of 48 hours warned the Germans that an attack was imminent but gave them little indication of the hour of attack.

LESSONS

The operation forcibly impressed the officers and tank crews of the platoon with the following lessons:

Joint tank-infantry training prior to actual combat is necessary in order to insure maximum cooperation and confidence.

Success can be obtained only when there exists close and continuous liaison between tanks and infantry. This is a responsibility of the tanks primarily.

Tanks, without infantry support, may be able to capture a position but are incapable of holding it. Infantry must move in on the heels of the tanks to "mop up" and hold the position.

Although the tanks support the infantry, infantry must clearly understand that the combined attack is a "fifty-fifty proposition" and requires mutal cooperation. The infantry must also support the tank action, particularly by locating hostile antitank weapons, informing tank crews of their locations, and destroying those weapons when it is within its power to do so.

Smoke screens, under favorable weather conditions, facilitate tank action and offer considerable protection against antitank weapons.

Whenever possible to do so, tank commanders as well as tank platoon leaders, should reconnoiter the area over which they are to operate.

CONCLUSION

Although tanks will play a most important part in the next war, they do not solve all the problems of the foot soldier advancing in the face of modern fire defenses. However, it is believed that the doughboy cannot successfully attack an organized defensive position—unless screened by darkness, fog or smoke—without the aid of tanks, and that a far greater number of tanks should be provided per mile of front than were given to us during the World War. In any future war, then, victory will rest with the nation better equipped with an adequate number of modern tanks. "We are moving, slow as the evolution may seem, toward the idea of the mounted infantryman-in-armour."

Foreign Notes

RADIO-TELEPHONIC COMMUNICATION BETWEEN TANKS

The London Daily Herald has recently published a report covering British experiments in radio-telephonic communication between tanks. This report indicates that wireless-telephonic communication is now practicable between tanks travelling over rough ground at speeds up to 40 miles per hour.

The transmitting and receiving apparatus, although compact and simple to operate, provides sufficient volume to be heard through the roar of the engine. The aerial is a short metal rod, fitted with a flexible mounting to avoid breakage in the event of touching a branch of a tree or other obstacle.

It is possible to hold two-way conversation between stationary tanks separated by 12 miles or more. But between moving tanks the effective radius of the two-way conversation is reduced to about three miles. The voice is invariably employed because the jolting and bumping inside the tank preclude the use of the Morse key.

INDIVIDUAL TANK FOR INFANTRY

This year the British 6th and 7th Infantry Brigade are conducting a new and highly important experiment in mechanization. They are carrying out exercises in the use of armored machine-gun carriers, with the gun fired from the vehicle, as a mobile accompaniment to the infantry advance. Thus the "armoured infantry" idea, which was dropped for a time, has a revived promise of fruitful development.

The London Daily Telegraph in a recent issue states that, using an "armoured crawler" of this kind, the infantryman may have a far better chance of getting within close range of the defending machine gunner in position behind cover. This tankette carries him forward much faster than if he tried to crawl, and with far less exposure than if he were to run, or walk upright, as heretofore.

The experimental "mechanical coffin" is only about 7 feet long, less than a yard wide, and stands only knee high. While travelling along the road, the occupant sits comfortably in his "perambulator", but on reaching the battelfield changes to a prone position, with his light machine gun pointing ahead.

The contraption was initially designed for a single man, but according to report, the British have under consideration a slightly wider but no higher type to carry two men.

COMBAT TRAIN VEHICLE

Some years ago the British developed the original one-man tank, which developed into the Carden-Lloyd tankette. These, although they were used effectively for an "in-fighting" role, were later relegated to the work of mere machine-gun carriers, the gun being dismounted for firing. Some such vehicle is essential in a modern army in order to rapidly displace machine guns and howitzer weapons.

The French are experimenting with a low-slung caterpillar tread motor vehicle. This model was designed primarily for supply of ammunition directly to front-line units, but may be used as a machine-gun carrier. It presents a target very difficult to hit since it is only about 3 feet high and travels over fairly rough, rolling country at some 20 miles per hour.

TACTICAL COOPERATION BETWEEN TANKS AND AIRPLANES

The following forward-looking thoughts are culled from a very interesting article appearing in the German periodical, Deutsche Luftwacht, Laftwehr edition.

Originally the English considered the tank the main weapon of future open warfare, and even believed it to be a guarantee against the return of stabilized war.* France on the other hand has considered the tank more of a pioneer weapon for simultaneous frontal attack. But France has also of late shared the impression that in the next war tanks will have a more independent and flexible task. Both these ideas involve the employment of large tank masses either in the very first stage of combat—before the entire mobilization of the mass of armies has been completed and the fronts thereby frozen—or, in later stages, to create a thoroughfare through the enemy front so to speak, as a reinforcement of the driving wing of the penetrating attack.

---

*The most radical exponents of this conception are Major General J. F. C. Fuller and Captain B. H. Liddell-Hart. But both these officers have modified their views considerably during the last few years.

Another factor compelling the use of tanks in large masses is the great effectiveness of improved antitank weapons. All armies will have to reckon with a higher percentage of losses than those of the World War.* Some authorities believe that tank casualties due to antitank defense will be so great that tank attack will have to be carried out under cover of smoke or other form of obscurity in order to obviate an undue percentage of losses.

With the use of large tank masses, the problem of tactical command gains dominant importance. A tank unit commander looking through a small slit, even under the best conditions, can observe only a small strip of terrain ahead. What is happening a few hundred yards on either side he can neither see nor hear. Thus the difficulties of commanding tanks in mass, from a fast moving tank, particularly in smoke or fog, are apparent.

---

*In the tank battle of Cambrai, even though the surprise element had a strong effect on the Germans as this weapon was entirely unknown, 107 of the 435 English tanks employed were put out of commission by the Germans.

Foreign countries have of late attempted to solve this problem by placing command of attacking tank squadrons in the air. One or several command planes, protected by pursuit, can, on comparatively unknown terrain, even from a considerable height when favored by the weather, lead several attacking tank waves covered by smoke. According to latest reports from Russia, experiments of this kind have already been made on a large scale. They found it advisable to subdivide the task of the command planes. One or two planes watch the terrain for the entire attacking tank squadron. Their instructions go direct to all tanks and serve as a general terrain orientation for all waves. Tank unit commanders in other planes keep leader tanks informed during the course of the attack and issue the necessary orders from the plane. Orders are then passed on by the leader tanks to individual tanks of the subdivision. This results in an almost automatic transfer of commands to the moving tanks and prevents the danger of individual tanks driving blindly over the terrain and not being on the spot at the decisive moment when the leader wants them.*

*Experiments of interest have been made in England, in which autogiros have been used instead of airplanes for combat command of tank masses.

The entire question of tactical cooperation between tanks and airplanes gains in importance in the same measure as the speed of tanks is increased. It is evident that the tactical command of tank waves from the ground is impracticable with each wave numbering 100 or more tanks, and moving 30 to 40 miles an hour. The survey of the comparatively large territory to be covered in a few minutes is constantly becoming less possible for the individual tank driver. His functions must more and more become similar to those of an operator of a fighting turret on a battleship.

INFANTRY ORGANIZATION

During the past year the British conducted a test of an infantry brigade consisting of headquarters, one support battalion, and three rifle battalions, instead of the present organization of headquarters and four battalions, each consisting of a support company and three rifle companies.

The object of the experimental organization is:

(1) Adjustment of the proportion of infantry to supporting arms.

(2) Simplification of tactical control of infantry supporting weapons.

(3) Simplification of peace training and reinforcements in war.

This organization places all the heavy machine guns and antitank guns in the support battalion, leaving to the rifle battalions, the 3-inch mortars and light machine guns.

The support battalion consists of a headquarters company, three machine-gun companies, and one antitank company. Each machine-gun company has three platoons of four heavy guns each; and the antitank company has four platoons each with four antitank guns.

The headquarters company of the rifle battalion con-

tains a mortar platoon of four 3-inch mortars and a light machine-gun platoon of four guns equipped with antiaircraft mounts. Each rifle company has four platoons of three sections each. Each section has a light machine gun, a total of 12 per company.

The mobility of all units of the brigade is greatly increased by more complete motorization and mechanization.

Concerning this experimental organization the military correspondent of the Daily Telegraph states:

> This highly important step towards the modernization and reorganization of the infantry is a welcome recognition of the need to increase not only the offensive power of the infantry, but also their mobility. And it is intended to clearly combine both aims in the new design.
>
> The increased automatic fire power tends to aid tactical mobility by overcoming the enemy's resistance. It has, however, tended to offset the gains by loading the infantry with heavy and complex weapons, so putting a brake on their own mobility. But if the weapons have mechanized means of movement, this handicap largely disappears. And if the heavier weapons are formed in a separate unit, the movements of the riflemen are freed from encumbrance and their tactical handling simplified.

RECONNAISSANCE GROUPS

An interesting feature of the French division and corps is the reconnaissance group, which is an organic part of each infantry division and corps. It is a highly mobile unit, formed in answer to the necessity in modern armies of obtaining information and protection at greater distances.

On the march the reconnaissance group is employed as an organ of information and security, and in battle as a reserve, and for exploitation. In securing information it forms the link between the aviation and the advance or rear guards. The need for such a link is apparent when we consider the radical alteration of former ideas in regard to time and space owing to the speed and great radius of action of motorized weapons.

Previously the corps reconnaissance group would cover the important avenues about two days' march ahead of the main body, while each division reconnaissance group covered the front of its division about one day's march ahead of the main body. Recently, however, the French have generally divided the corps front into three or more zones with a reconnaissance group of the corps or a division operating in each zone about a day's march ahead of the main bodies. Frequently a battalion of infantry in trucks is attached to a reconnaissance group. If large cavalry units are covering the front of an advance, the reconnaissance group maintains liaison between the cavalry and the infantry advance guards and also provides close-in security.